NATIONAL MUSEUM OF VICTORIA

Vol. XXI. Part 11.

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The Journal of the Department of Agriculture of Victoria, Australia.

November, 1923

PRINCIPAL CONTENTS

Dairy Type and its Value

Results of Potato Experiments

Oidium of the Vine

Passion Fruit Culture

Value of Fruit as Article of Diet

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THE JOURNAL

OF

THE DEPARTMENT OF AGRICULTURE,

VICTORIA, AUSTRALIA.

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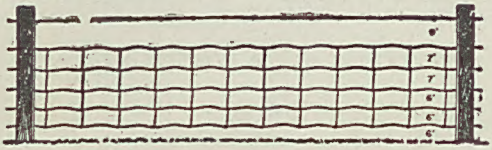

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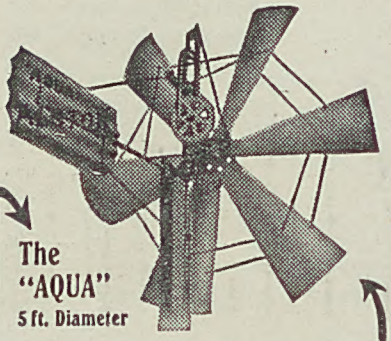

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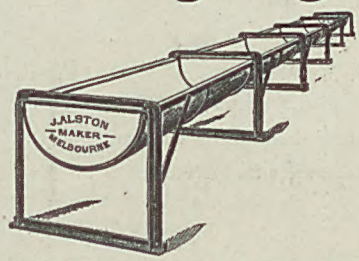

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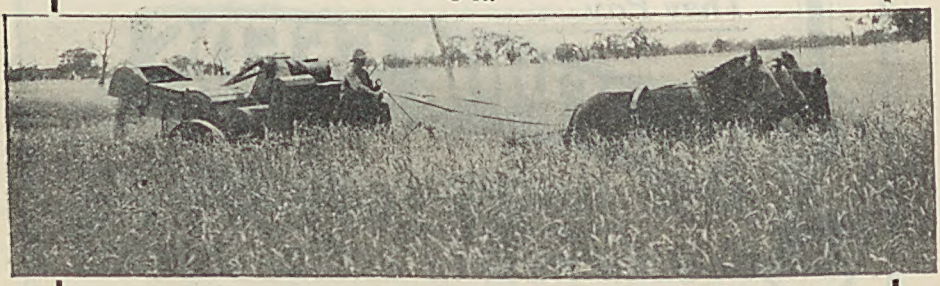

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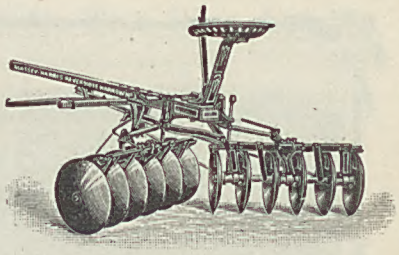

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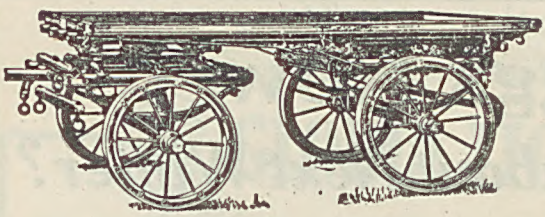

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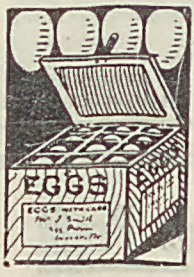

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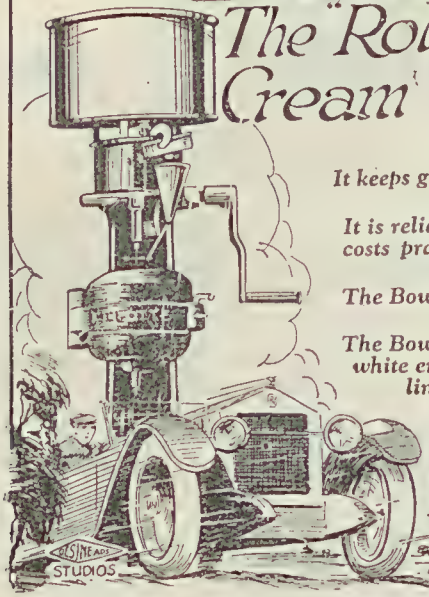

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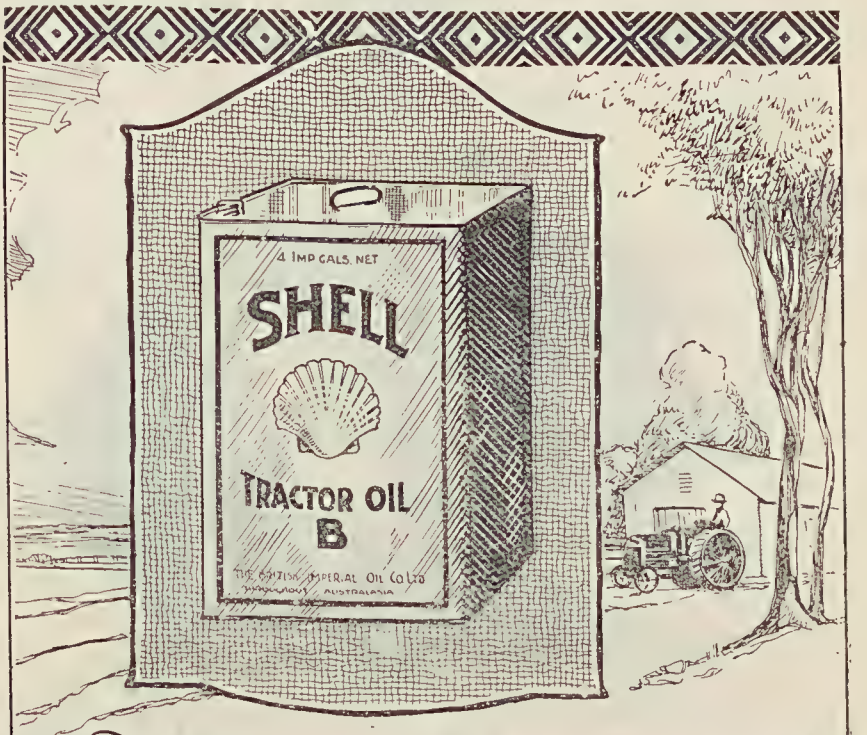

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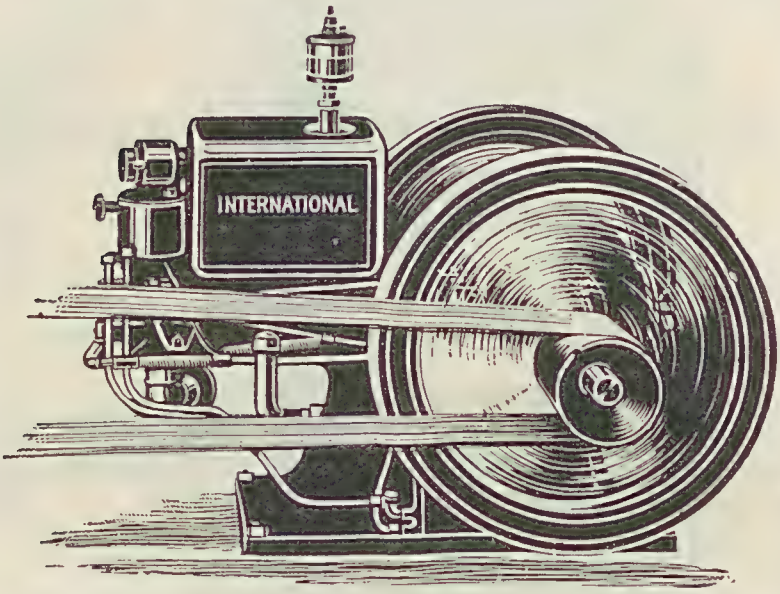

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PASSION FRUIT CULTURE IN VICTORIA.

(Continued from page 611.)

By J. Farrell, Orchard Supervisor.

XVII.—Yield Per Acre, Marketing Fresh Fruit, Prices, Uses, Processing, and Prospects of the Industry.

Passions usually come into full bearing at from five or six years old, but the subsequent annual yield of fruit varies considerably, according to the nature of the cultural, manurial, and other treatment bestowed on the vines during the period of development. In adopting the 18-ft. x 12-ft. system of planting, provision is made for, approximately, 200 vines per acre, and, when cared for in a reasonable way, a case of fruit to the vine, or 200 cases per acre per annum, may be regarded as a fair average crop. Conditions of growth also largely influence the size and quality of the fruits.

In cultivating the common Black Passion, the main objective should be the production of the largest fruits possible for the variety. Uniformity in size is also desirable, and the fruit should be graded prior to being marketed. Large fruits of uniform size with dark, smooth skins, command the highest price, whereas, the mixing of large and small fruits in a case affects, in the inverse ratio, the commercial value of the better specimens. For instance, a case of well-graded small fruit is of higher value than one in which occasional large fruits appear. Measured longitudinally, the larger, well-proportioned, common black fruits may reach an average of 2¼ inches; whereas a similar measurement of the smaller, inferior types would, probably, not average more than 1½ inches. This recognised discrepancy in its size and quality makes, when the higher prices obtainable are desired, the grading of fresh fruit for market obligatory.

The fruit should not be allowed to remain on the vines after it has reached the ripe stage, for it soon begins to wilt and deteriorate in commercial value. It should, therefore, be picked and placed on the market with as little delay as possible. The skins of ripe fruit are dark-purple, smooth, and glossy, the perfect specimens being well filled with pulp and seeds. As previously stated, the sacks of pulp, each containing one seed, are borne on short stout fibres attached to and projecting from the inside of the fruit capsule. In dry warm weather particularly, the fruit capsule quickly loses its natural moisture, and the pulp-sack, because of its connexion with the shell, also soon parts with its liquid. This creates a vacuum which is indicated by indentations appearing in the outer surface of the fruit, commonly termed "wilting." Although the pulp of slightly crinkled fruit is the more palatable as a dessert, it is obvious, nevertheless, that passions should be marketed as soon as possible after ripening.

Nature provides fruits of normal development with 150 pulp-vessels and seeds, but sometimes all do not ripen, though as many as 158 seeds have been found in abnormal specimens, while the average number in sub-normal fruits may not exceed 140. However, the cash value of a fruit cannot be based solely on the number of pulp-vessels and seeds, but rather on the actual quantity of pulp it contains, and as a rule the best filled fruits are those of normal development containing the highest number of seeds for their class.

Passion fruit is usually sold unwrapped in the ordinary two-division bushel case, which contains about 35 dozen fresh fruits of medium size, weighing about 34 lbs. Prices vary considerably during the fruit season; early fruits, about the beginning of March, bring from 20s. to 25s. per case; later, when the supply is more plentiful, from 8s. to 12s.; then, near the end of the late crop, from 23s to 30s.; while small lots later sometimes command 40s. It is somewhat difficult to strike an average; but, for the last few years, this would probably be in the vicinity of 15s. per case for the fruit season.

The ever increasing popularity of this deliciously flavoured fruit for use as a dessert, its suitability for jam making, flavouring fruit salads, for icings, making cakes, &c., has insured it a permanent place in the fruit markets of the Commonwealth. Notwithstanding the increasing local demand for the passion, the relatively extensive areas being brought under its cultivation will necessitate the finding of markets for a sure, future exportable surplus. The best and most economic method of exporting passion fruit is in the form of pulp, which, because of its unique virtues, has fortunately already made an extremely favorable impression on its users in England, America, and other countries.

The processing or pulping of passions consists of cutting the fruits in halves, and removing the pulp from the capsules by the aid of peach-pitting, or ordinary spoons. The pulp is then placed in lacquered tins or glass jars, the latter being mostly used for the purpose. A little syrup is added; then the mixture is sterilized by heating same to a temperature of from 180 deg. to 190 deg. Fahr. for from fifteen to

twenty minutes, as a further factor in preserving it. Or the pure pulp may be placed in containers, such as are used for bottled fruits, and sterilized in the ordinary way.

Relatively large quantities of passions are treated by manufacturers during the fruit season, and they find that a bushel case contains from 30 dozen to 36 dozen fruits, according to size, and that the quantity of pulp obtained from a case is from 10 lbs. to 14 lbs. This, they say, is worth anything between 1s. 6d. and 3s. per lb., according to the method of processing, style of container, and general get-up; and that from 10s. to 11s. per case is the outside price that manufacturers can give for passion fruit for this purpose. The Mammoth is less suitable for pulping than the Common Black variety; and, although there is a limited market for Banana passions (*Tacsonia*) for dessert purposes, &c., these are of little value for processing.

There is a feeling in England and America that the numerous black seeds which characterize this fruit should be removed at the pulping; but Australians acquainted with same who see samples of this seedless pulp abroad, usually assume that it is not the "real article."

There is an ever-increasing demand for passion pulp, as well as for the fresh fruit, and recently a large catering firm in London sent an order to Australia for 1,000 cases of bottled pulp. Assuming that the demand for this article during the next five years increases at the same ratio as happened in the last five, and if care be taken in the cultivation of the vines and in marketing the fruit, the prospects of the industry would seem to be assured.

PLANTS OF VICTORIA.

A volume containing a census of the plants of Victoria with their regional distribution and their vernacular names has been published by the Field Naturalists' Club. This work had its beginning in the year 1907, when a committee was appointed to fix popular names for the better known native plants. Later it was decided to make the purpose a more ambitious one, and to include all the known plants of the Victorian flora; this meant that some 2,000 species, few of which possessed suitable vernacular names, had to be dealt with. Lists of plants to which names were given provisionally were drawn up and distributed, and were afterwards revised in the light of criticisms given them, and where necessary, the scientific names were altered to meet the requirements of the international rules of botanical nomenclature.

The book, which will be of great use to every one desiring a better acquaintance with our native plants, is obtainable from the Field Naturalists' Club, Royal Society's Hall, Victoria-street, Melbourne. Its price is 3s. 6d.

DAIRY TYPE AND ITS VALUE.

By J. S. McFadzean, Senior Dairy Supervisor.

THE TYPICAL COW.

It would be well if every one proposing to take up dairy farming as a business would make it the initial step, prior to establishing a herd, to become as fully conversant as possible with the subject of dairy type. In the eye of the expert stock-breeder, the typical well-bred dairy cow is a perfect combination of bovine elegance and utility. Her conformation is such that, when walking, her action is a graceful movement; her head is held with alert poise, indicative of full vitality; the body carried with just that freedom of action which precludes any suggestion of awkwardness; the legs and feet move straight forward, taking each step clear of the ground and clear of each other; and the whole action of the animal expresses a litheness which indicates symmetrical conformation concealing powerful muscular development. Such an animal when framed on the lines hereafter mentioned will invariably be capable of high annual milk production; and, broadly speaking, the more closely a herd of cattle approaches this ideal in its individual members the higher will its average dairy production be.

VALUE OF TYPE.

Just as there are exceptions to other rules, so also are variations from accepted dairy type to be found in all dairy breeds. Occasionally a coarse and somewhat clumsy-looking cow has proved a good producer, but it would be most unwise to use such an animal in stud-breeding work with the expectation of her quality being reproduced, for it is almost certain that her progeny would not prove satisfactory as dairy stock. The experience of very many generations of stock-breeders has been that certain types of animals must be bred for certain purposes if the highest degree of success is to be attained, and persistent disregard of this will result in certain failure. Accepted dairy type must therefore be the first point considered in the selection of the breeding stock if high dairy production is to be maintained. It is for this reason that every farmer should become as proficient in this subject as his eye will permit; and all his selections of dairy stock for breeding purposes should be made in close conformity with true dairy type. Illustrations of dairy types appear on pages 648 and 650, and a general description thereof is also supplied.

THE TYPICAL POINTS.

The Head.

In the selection of all stud stock the shape and character of the head is highly important. It is one of the main indications of breed. Whether it is fine or coarse and of reasonably correct shape and size is so largely considered a guide to the other sections that, in the judging ring, any serious departure from a typical head will usually put an animal out of competition. Besides being the first section to catch the eye, and thus conveying a first and telling impression, the head carries much indication of an animal's temperament, and this

is an important factor in dairy production. A coarse-headed animal will not be fine in other sections. Also shape and size of mouth, nostrils, eyes, ears, and horns make up the typical head; and each of these parts gives some clue to the peculiarities of each individual animal.

In size the head should be proportionate with that of the body, and shaped according to the breed of the animal. As with all other parts of the body of a well-bred dairy cow, the skin and hair of the head should be fine in quality and soft to the touch. The horns should be shaped and carried according to the peculiarity of each breed, but they should be always fine in grain, somewhat thin, and tapering neatly to the points; such will materially add to the appearance of any show animal. The ears must be fine in quality with thin hair, and their movement will be indicative of the temperament of the animal as to alertness. The eyes should be large, prominent, and bright, a sunken small eye being usually accompanied by a sluggish disposition, while dullness is suggestive of ill-health. The mouth should be broad, allowing for strong teeth, which should meet evenly against the pad or gum in the upper jaw, giving that breadth and depth essential to maintain a long-lasting set of teeth on all kinds of grazing. An animal with an undershot jaw is referred to as being pig-mouthed, and this is considered a deformity; while the failure of the teeth to meet the upper jaw properly places the animal at a great disadvantage in grazing, more especially on short pasture.

Wide nostrils will usually accompany the broad muzzle, and are considered to indicate good lung development. Thick skin or much loose skin below the jaws is not favoured, as this gives the animal what is known as a "throaty" appearance; and for the reason that any thickening or unevenness below or to the back of the jaws may be considered as suggestive of disease in those glands which lie under the skin at that part, all such animals may well be avoided by inexperienced persons when buying.

Neck and Shoulder.

The neck should be moderately long, tapering off neatly from head to shoulder, the top line running almost straight from the back of the head to top of shoulder at wither, making just the slightest inclination towards a curve between head and shoulder. The bones of the shoulder blades should be broad and flat, and running thin at the top should leave the wither narrow across and lean of flesh, the typical dairy cow carrying no flesh along the back bone from head to tail. A lean neck running evenly into the shoulder will leave both the wither at the top and the brisket underneath clean and free from coarseness.

Shanks.

The fine quality of the bone in the well-bred cow or heifer will be very noticeable in the shanks and hoofs, which will be neat and trim in appearance. If running on soft land, the hoofs may occasionally grow long and require trimming, but on ordinary grazing land they should wear evenly and maintain a trim, tidy appearance.

Back and Body.

While the wither should be narrow, and the shoulder bones meeting them thin, the shoulder blades below should spread well apart to give

breadth of chest; and behind this the body should widen out still more, consequent on the ribs being well hooped out from the backbone. The top line of the back, while rising slightly, should appear almost straight from shoulder to butt of tail, showing a lean, well-knit spinal column from which the ribs arch out evenly, giving breadth to the body as well as robust appearance. The ribs should be wide in bone and set close together. The loin should be wide and strong, and the joints of the backbone closely knit. The large body of a typical dairy cow is a big weight on the backbone, and unless it is closely knit at the joints, the animal will soon sag from the loin and become unshapely. This even widening out from between the shoulders to the middle of the body in front of the flank gives full room for heart and lung movement, and allows of ample stomach capacity for consuming and digesting the large quantity of fodder essential for the production of a heavy flow of milk.

Hind-quarters.

The hips should be spare of flesh and set wide apart, the front pin bones being set well forward above the flanks and level with the backbone, thus giving a broad, square-topped appearance to the rump, and allowing for good udder development below. The thighs must be broad on the side, but lean when viewed from the rear; and with the hind legs set straight under the wide hips there will be full room for the expansion of the udder when the cow is in full milk without unduly hampering her action in walking. The tail should be fine in bone, tapering off from the back bone to the hocks, where a switch of fine quality hair should finish it off neatly. It must be set squarely on to the rump, the butt being level with the backbone, and it should hang almost straight from the end of the back to the tips of the hocks when the animal is standing, thus giving a neat right-angle finish to the body.

Skin.

The skin of a healthy and properly conditioned milking cow should feel soft and pliable, lifting easily from the rib. Some judges have a decided preference for yellow colour of the skin inside the ears, on the escutcheon, and on the tip of the tail, considering this as an indication of rich quality milk, probably because this skin colouring is general in stock of those rich-milking Channel Island breeds—the Guernsey and Jersey. Thick, dry, or harsh skin is not desirable, for thickness of skin is generally accompanied by coarseness in bone, and such animals are more liable to fatten under good feeding than to give a heavy and sustained milk yield, while dryness of the skin is usually a sign of unthriftiness from some cause.

Udder.

The udder or mammary gland, being the organ wherein the conversion of the blood into milk and butter-fat takes place, is considered the most important part of the dairy cow. In the judging of the special dairy breeds of Ayrshires and Jerseys, the udder is allowed about 35 per cent. of the total points allotted to the cow, showing the high value placed thereon by breeders of these cattle. Extra size in udder is not as important as good shape. Some cows with com-

paratively small udder development are very heavy milkers, but this is not the rule; thus a reasonably large udder is looked for by those expert in choosing a good dairy cow. On the other hand an extra large and pendulous vessel (as the udder is frequently termed) is a hindrance to the free walking action of the cow. It is also more liable to injury when unduly large than when moderate in size and carried close to the body without lateral movement. An unshapely udder makes for uneven milk production from the different quarters. The vessel should also milk out soft, handling even and free of flesh, fleshy-uddered cows usually being anything but heavy milkers.

The teats should be placed evenly towards the centre of each quarter, pointing down, about 2½ inches long, full and even in shape, and not tapering. Dark-coloured teats are preferred, as a white skin is more liable to chap with cold or blister with heat, leaving the teats sore. With any injury to the teats the pain of milking interferes much with the yield, while the work will be protracted owing to the animal kicking. Cows with thin teats, unevenly-shaped teats, or with teats unduly long and thick, are always more difficult to draw the milk from than those having teats moderate in size and evenly-shaped.

The udder should extend well forward on the underline of the body, and also carry well up to the rear, conforming as evenly as possible with the body line, and without any bulging or baggy formation. When full it will then extend evenly, and the teats, when properly placed, will still point down, giving the vessel a neat appearance.

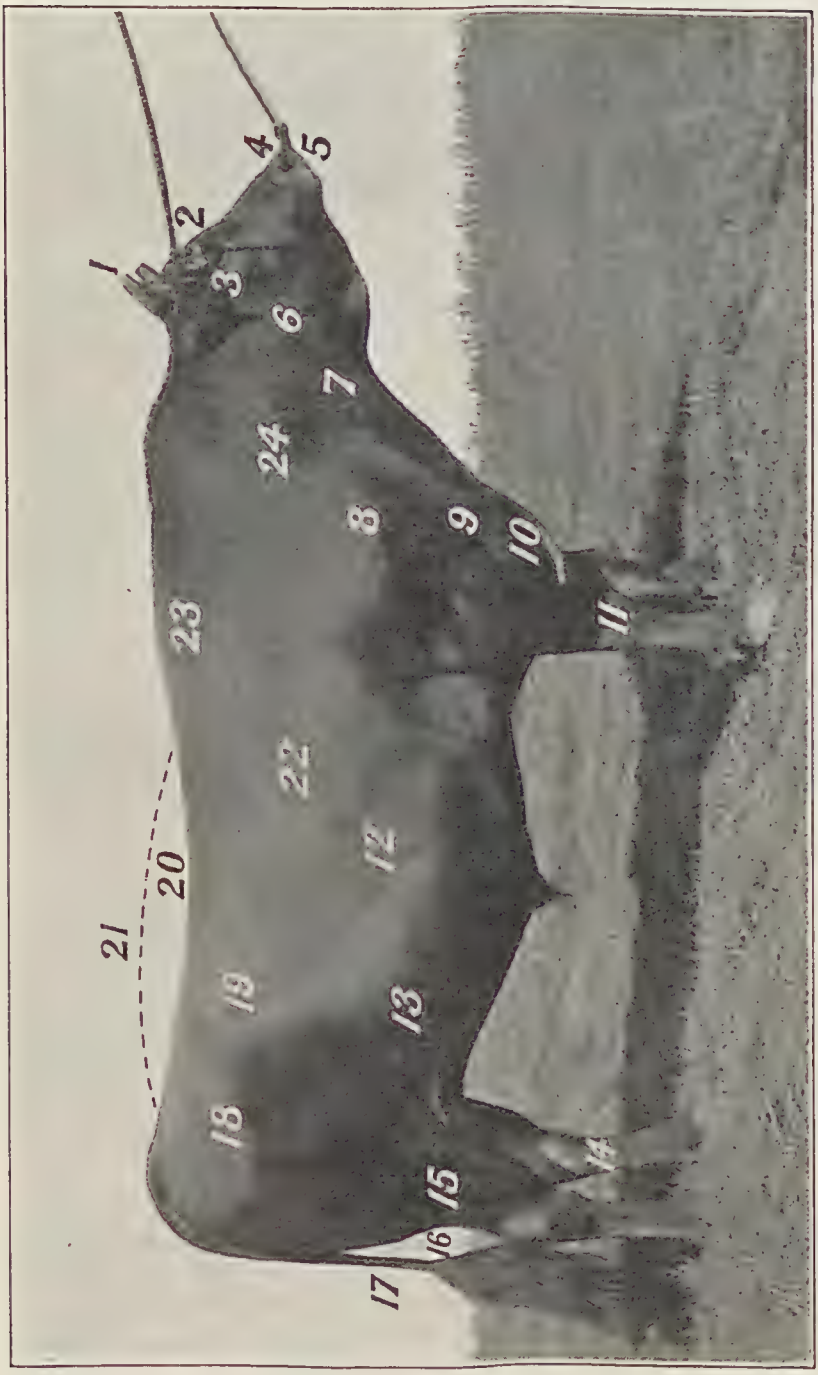
More particularly with heifers, for some little time before and after calving the udder may become inflamed by the extra flow of blood, causing a flagging or swelling of the surface and underlying tissue, and the process of milking may then become exceedingly painful to the animal. With this flagging the milk is not affected, and with regular and clean milking out twice or three times daily, preceded and followed by hot fomentations, in a week or so the udder should resume its natural soft condition, free of all lumps or thickening of tissue, unless otherwise affected by disease or injury.

Milk Veins.

With fine-skinned, heavy-milking cows the so-called "milk veins," which are really blood vessels, show out prominently underneath the skin of the body on each side. Those running from the udder towards the fore-legs disappear in the so-called "milk wells," which are orifices from one-half to a quarter of an inch in diameter about midway between the navel and the fore-leg on each side of the underneath part of the abdomen. Prominent "milk veins" and large "milk wells" are usually an indication that the animal is a very heavy milker.

Escutcheon.

The thin skin at the rear of the thighs and immediately above the main portion of the udder—over which the hair lies upwards—is known as the escutcheon. Several of the points connected therewith are worth study as a guide to the ability of an animal to produce milk under suitable conditions, and as to the length of time a good yield will be maintained. This subject has been dealt with in a separate article.



Typical Dairy Bull.

For explanation of numbers see opposite page.

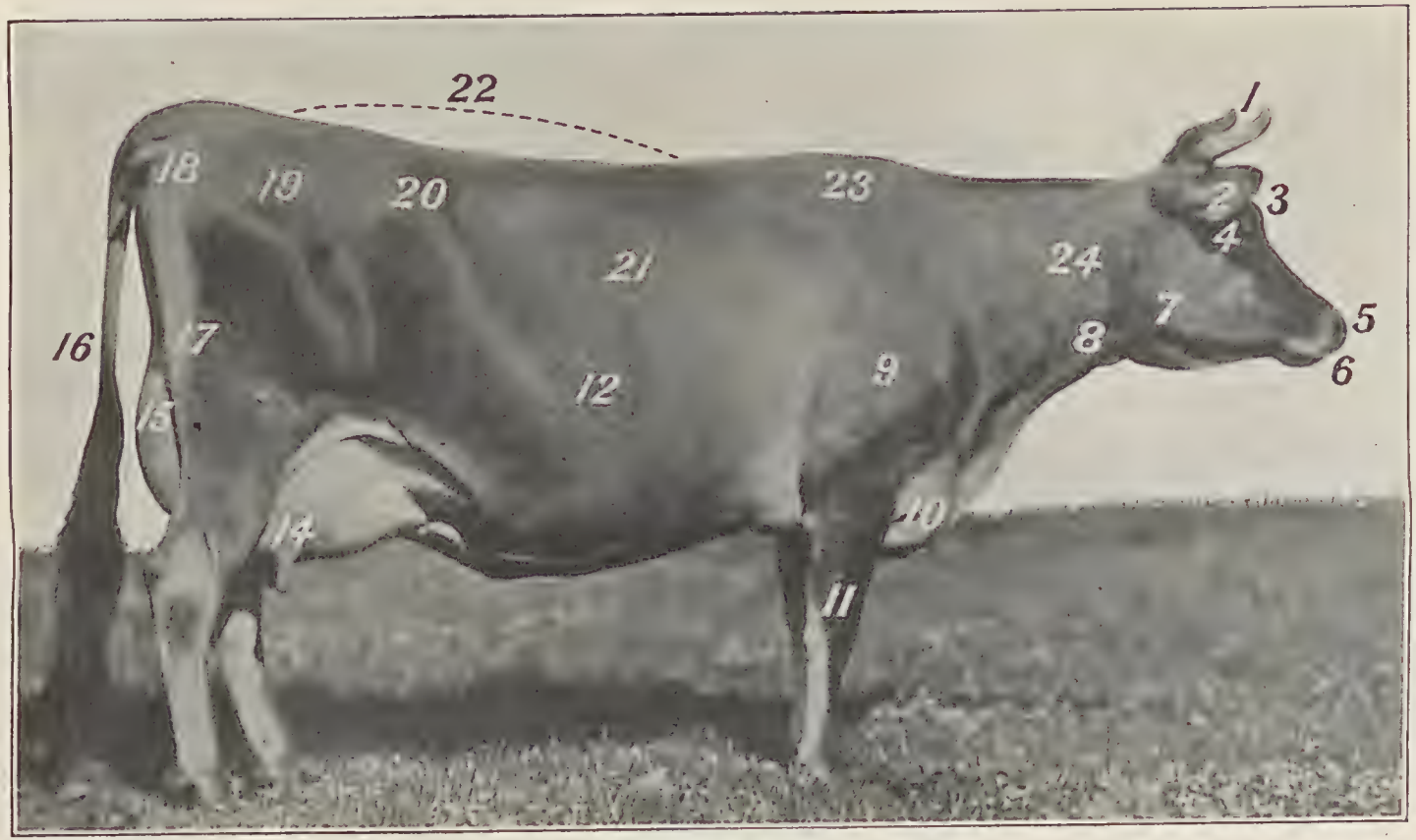
Points of a Typical Dairy Bull.

1. Horns—fine in quality, and shapely.
2. Forehead—broad.
3. Eyes—large and bright.
4. Nostrils—wide.
5. Muzzle—broad and deep.
6. Jaw—strong, but clean-cut.
7. Throat—clean, with fine skin.
8. Shoulder—broad flat bone.
9. Chest—broad and deep.
10. Brisket—lean and light.
11. Fore Legs—fine in bone, wide apart, and straight under body.
12. Barrel—long, broad, and deep.
13. Flank—deep and lean.
14. Shanks—fine in bone.
15. Hind Legs—straight, set well apart.
16. Thighs—lean.
17. Tail—long, fine, and tapering.
18. Rump—long, broad, and level across top.
19. Hip Bones—prominent and wide apart.
20. Back—broad across loin.
21. Back—long, and fairly straight.
22. Ribs—well hooped, with soft pliable skin.
23. Wither—lean, sloping off to shoulder.
24. Neck—fairly long and strong, but lean.

Remarks on Photograph.

The photograph reproduced on the opposite page is of a Jersey bull which is a very good specimen of its breed; but the picture does not show the animal to advantage. It possibly was in a combative mood, for it has been taken with both head and hindquarters slightly turned away from the camera. This has thrown the shoulder outward, making the bone look round in shape rather than flat. The tips of the horns have been sawn off. The nose is pulled somewhat forward by the rope attached to the leading ring. There is the usual amount of loose skin below the jaw that is found in mature bulls, but the shape of the jaw is clearly defined, showing that the skin is fine in quality. The left front leg is not properly discerned owing to the shadow falling across it.

The body of this bull is fairly well developed, but the picture shows a slight hollow over the loin, which is mainly due to the position in which the bull was standing. The rump being turned away has made the animal look short between pin and hip bones; while the apparent fullness of the buttock is also due to the same cause, giving a fleshy, rather than a lean, appearance at that part. The junction of the tail with the backbone also appears too far forward, and the picture does not illustrate the square finish to the bull's body so much appreciated by breeders.



Typical Dairy Cow.

For explanation of numbers see opposite page.

Points of a Typical Dairy Cow.

1. Horns—fine and shapely.
2. Ears—thin.
3. Forehead—broad.
4. Eyes—large and bright.
5. Nostrils—wide.
6. Muzzle—broad and deep.
7. Jaw—clean, with thin skin.
8. Neck—lean and shapely.
9. Shoulders—broad flat bone.
10. Brisket—thin and light.
11. Fore Legs—fine in bone, straight, and set wide apart.
12. Barrel—long, broad, and deep.
13. Udder—carrying well forward.
14. Teats—squarely placed, and pointing down.
15. Udder—evenly full at rear.
16. Tail—long, tapering, with fine hair.
17. Thighs—lean, set wide apart.
18. Pin Bones—prominent, and set well apart.
19. Rump—long, broad, and level across.
20. Hip Bones—prominent, and wide apart.
21. Ribs—well hooped, with skin soft and loose.
22. Back—broad and straight.
23. Wither—fine, sloping out to shoulder.
24. Neck—long and lean.

Remarks on Photograph.

The reproduction of the cow shows a Jersey of excellent type. Her head may be a little long to suit some critics. The picture has been taken with the hind legs a little too far forward. This has made the rump look much higher than the shoulder, and, by giving a somewhat crouching attitude to the hindquarters, it has thrown the hinder part of the udder too far out. The body is well developed, and the milk veins can be plainly seen along the belly in front of the udder. The vessel might carry a little more straight forward and level where it junctions with the body, instead of rounding up short as illustrated.

The photographs are the best that could be found for reproduction from amongst a large number, and any one in possession of animals such as these should be able to win many show-ring prizes on type.

Action.

The walk or action of the dairy cow should be free, graceful, and active in proportion to its size, and its size should be medium in conformity with its breed. Either undersized or extra large animals of any breed are usually not the best producers or breeders, medium-sized stock being most generally satisfactory for dairy work, and breeding more true to type. Heavy-framed animals are inclined to be sluggish, and, except on the best of country, are anything but good foragers. Stock unduly light in frame are not properly developed, and when well bred are frequently of such nervous temperament that it interferes with their dairy production.

Symmetry.

This is a term applied to the even balance which should exist between the several sections of an animal as viewed from the stand-point of proper development. The size, shape, and general conformation of each and every part should harmonize correctly with the rest, giving the animal an evenness of outline which is pleasing to the eye; and a study of these pages will have shown that in every section such desired development has also a sound utility basis.

Other Features.

There are other points connected with the selection of good dairy cattle which individual buyers or judges may show special preference for, such as colour, shape of horns, length of leg, &c., but which have little bearing on the general type of dairy stock, being rather breed peculiarities. The observant dairy farmer will soon note these, and probably through meeting with a few good cows, or a few unsatisfactory ones, with some common characteristic in shape or colour, he also may become prejudiced in a similar way to those mentioned as regards some particular point. For instance, many of those who deal in crossbred cattle are partial to brindled animals, which possibly arises from this colour frequently occurring through a cross of the Jersey breed, which has also given good dairy quality. Some have a fancy for blue, roan, or strawberry markings, while others come close to fact when they say that a good cow cannot be of a bad colour, thereby expressing their opinion that colour is little guide to dairy quality.

Origin of Dairy Type.

It is an indisputable fact that the points set out here in detail are generally accepted in all countries as indications of high dairy quality, and cows which conform closely to these will, with proper feeding, rank high as milk producers irrespective of their breed. There are occasional exceptions to this, for at times some promising-looking animal may not come up to expectation in production. This, however, most probably will prove to be a matter of temperament, as some highly-bred cows are extremely nervous in disposition, and through not being handled in the most suitable way may prove disappointing as producers. Again, while a big and somewhat coarse-looking cow may turn out to be a very heavy milker, usually such cattle do not sustain a good flow of milk for more than four or five months—if even that long—so that, broadly speaking, good dairy type

is invariably accompanied by satisfactory dairy production and *vice versâ*.

The combination of the several points which constitute what is known as good dairy type is nothing more or less than the result of the experience of generations of stock-breeders. Long study of cows has shown that the great majority of good milk-producers are of this conformation, the evidence on this point being so strong that in every dairying country and with every dairy breed such conformation is recognised as "dairy type."

BUTTER-FAT QUALITY.

Dairy type, however, covers only milk production. So far nothing is known which gives any definite guide to the butter-fat quality of a cow's milk other than her breed. Nothing short of the actual test of samples taken at two consecutive milkings during the third, fourth, and fifth months of the lactation period will provide a reliable guide to the average butter-fat quality of any cow's milk. From data obtained through official herd-test work regarding different breeds of cattle a reasonable estimate may be made of the average of a herd of any one of the more popular breeds, but between individual cows of any of these breeds there may be a difference in the quality of the milk amounting to even more than 40 per cent. of butter-fat. This can only be discovered by actual test, and this fact no progressive dairy farmer can afford to ignore.

THE INFLUENCE OF HERD-TESTING.

The influence of herd-testing is frequently very manifest during the second testing season for the herd. For example, among the herd-testing associations whose computations were made at the headquarters of the Dairy Division during 1920-21 and 1921-22 there were some 218 herds which were tested in both these seasons. The yield of the average cow in these herds increased from 213 lbs. to 253 lbs. of butter-fat, or about 19 per cent. Even granting that some portion of this increase may have been due to the fact that 1921-22 was a better season for grass, much of the improvement is undoubtedly due to knowledge gained as the result of the previous season's testing. In these herds the number of cows tested each season was very similar. Our figures show that often dairy farmers reduce their herds as the result of testing, and still maintain the total yield of the herd. We also have data which show that in certain cases during a second testing season, with only two-thirds of the previous season's herd, the total butter-fat produced underwent no reduction, while one dairy farmer during his first testing-year milked twenty-three cows to produce as much butter-fat as did sixteen which he milked two seasons later.

Instances which bear out the same principle could be multiplied.—W. M. Singleton, Director of the Dairy Division, in the New Zealand *Journal of Agriculture.*

RESULTS OF POTATO EXPERIMENTS, 1922-23.

J. T. Ramsay, Potato Expert.

The results of these trials, conducted by the Department of Agriculture during the past season, are herewith submitted. With the exception of the Korumburra and Catani (late Modella) districts, the others suffered severely from an extremely dry spell of weather from the date of planting until harvesting. The yields consequently are relatively low as compared with those obtainable in a normal or favorable season. One fact, however, clearly demonstrated is that judicious expenditure on manures for application to the potato crop is a sound and profitable investment.

In addition to the manures tested and tabulated below, lime (ground limestone), at the rate of 1 ton per acre, was tried on sections of each of the three fields at Catani, Kinglake, and Thorpdale, but in no case was there any appreciable increase in the crop obtained.

In computing the cash value of the returns, the crop has been calculated at the value of £10 per ton. While this is a high rate, it is justifiable to use it for this season's crop, owing to the very high values per ton which potatoes have realized. At the date of writing the market quotation for prime samples is £17 10s. per ton.

In the tabulation of the results, the rates per acre, and varieties of manures applied are given, together with tonnage and percentage increases due to manures, cost of manures, and the value of crop resulting from the varied treatments. The respective performances, expressed in terms of £ s. d., can be seen at a glance.

Potato Trials, Millbrook, 1922-23.

Manures Section.

Plot.	Manure per Acre.	Yield.			Increase due to Manure.			Increase from Manure.	Manure Cost per Acre.			Value of Crop per Acre at £10 per Ton.		
		t.	c.	qr.	t.	c.	qr.	%	£	*s.*	*d.*	£	*s.*	*d.*
1	2½ cwt. Super.	4	2	0	1	17	0	82	0	16	3	41	0	0
2	2½ cwt. Super. 1 cwt. Sulp. Potash	4	18	0	2	13	0	117	1	18	6	49	0	0
3	2½ cwt. Super. 1 cwt. Sulp. Ammonia	4	3	0	1	18	0	84	1	14	3	41	10	0
4	2½ cwt. Super. 1 cwt. Sulp. Potash 1 cwt. Sulp. Ammonia	4	18	0	2	13	0	117	2	16	6	49	0	0
5	2½ cwt. Market Garden	4	3	0	1	18	0	84	1	0	0	41	10	0
6	2½ cwt. Basic Phosphate	3	18	0	1	13	0	73	0	13	3	39	0	0
7	No Manure	2	5	0	..			..	..			22	10	0

Variety Section Manured with 2½ Cwt. Superphosphate Per Acre.

Late Varieties.					Early Varieties.				
Name.	Yield.				Name.	Yield.			
	t.	c.	qrs.	lbs.		t.	c.	qrs.	lbs.
Carmen	5	8	2	0	Earliest of All ..	3	0	1	0
Red Ohio	4	10	0	0	American Wonder ..	2	2	0	0
Brownells	4	7	2	0	Peerless	2	2	0	0
Duchess	3	15	0	0	White Rose ..	2	2	0	0
Minatio	5	0	0	0	Manistee	1	13	3	0
Manhattan	3	15	0	0					
Brown's River	3	12	0	0					
Clark's Main Crop ..	1	12	0	0					

Selected Seed Section.

Carmen III.	Yield.				Increase from Selection.				Per cent. Increase.	Value of Crop at £10 per Ton.		
	t.	c.	qrs.	lbs.	t.	c.	qrs.	lbs.	%	£	*s.*	*d.*
I. Selected seed from plants giving 10 tubers or over	5	14	0	0	1	12	0	0	31	57	0	0
II. Selected seed from plants giving 7 to 9 tubers ..	5	12	0	0	1	10	0	0	28	56	0	0
III. Seed from the run of the crop 4 to 6 tubers per plant	4	7	0	0	..				..	43	10	0
IV. Seed from plants giving under 4 tubers ..	4	2	0	0	−0	5	0	0	− 5	41	0	0

Minus (−) signifies decrease.

In view of the haphazard method of seed saving common to most growers the above Selected Seed Table is of considerable importance. The treatment given to the four classes of seed was identical in the makers of soil, cultivation, and manuring. It may be fairly assumed that 95 per cent. of the crop grown in the Commonwealth is planted with seed of class number III., *i.e.*, the run of the crop. Yet with a little attention to selection, as illustrated above, the yield can be increased by over 25 per cent. It is not suggested for a moment that large growers should go to the trouble, in any one year, of selecting seed of high standard sufficient to plant their whole acreage. It is strongly advocated, however, that each season a small quantity of seed should be obtained from plants of high prolificacy and true type from which a stud plot for the production of seed for the following year may be grown. By this means it would only take a year or two to produce high-quality seed ample to plant a large area.

Korumburra Results, 1922-23.

Manure Trials.

Plot.	Manure per Acre.	Yield.			Manure Increase.			Per cent. Increase.	Manure Costs.			Value of Crop per Acre at £10 per Ton.		
		t.	c.	qr.	t.	c.	qr.	%	£	s.	d.	£	s.	d.
1	5 cwt. Super. ..	7	10	0	2	7	0	45	1	12	6	75	0	0
2	5 cwt. Super. + 1 cwt. Sulp. Potash	7	0	0	1	17	0	36	2	14	9	70	0	0
3	5 cwt. Super. 5 + 1 cwt. Sulp. Ammonia	7	4	2	2	1	2	40	2	10	6	72	5	0
4	No Manure	5	3	0	..			..	..			51	10	0
5	5 cwt. Super. + 1 cwt. Sulp. Potash + 1 cwt. Sulp. Ammonia	9	16	0	4	13	0	90	3	12	9	98	0	0
6	5 cwt. Market Garden	9	19	0	4	16	0	93	2	0	0	99	10	0
7	5 cwt. Basic Phosphate	8	16	0	4	13	0	70	1	6	3	88	0	0

Catani Results, 1922-23.

Manure Trials.

Plot.	Manure per Acre.	Yield.			Increase due to Manure.			Increase due to Manure.	Manure Cost per Acre.			Value of Crop per Acre at £10 per Ton.		
		t.	c.	qrs.	t.	c.	qrs.	%	£	s.	d.	£	s.	d.
1	5 cwt. Basic Phosphate	5	8	0	2	8	0	80	1	6	3	54	0	0
2	5 cwt. Basic Phosphate + 1 cwt. Sulp. Potash	5	16	2	2	16	2	98	1	17	5	58	5	0
3	5 cwt. Bone and Super.	6	10	0	3	10	0	116	2	0	0	65	0	0
4	5 cwt. Bone and Super. + 1 cwt. Sulph. Potash	6	8	0	3	8	0	113	3	2	3	64	0	0
*5	No Manure	3	6	0	..			..	..			33	0	0
6	5 cwt. Super. ..	6	8	0	3	8	0	113	1	12	6	64	0	0
7	5 cwt. Super. + 1 cwt. Sulp. Potash	4	18	0	1	18	0	63	2	14	9	49	0	0
8	5 cwt. Super. + 1 cwt. Sulp. Potash + 1 cwt. Sulp. Ammonia	5	18	0	2	18	0	89	3	12	9	59	0	0
9	2 cwt. Super. ..	3	15	0	0	15	0	25	0	13	0	37	10	0
*10	No Manure	2	14	0	..			..	..			27	0	0

* Average return from two no-manure sections taken for comparison with manure results.

Kinglake Results, 1922-23.

Plot.	Manure per Acre.	Yield.			Variation due to Manure.			Increase or Decrease due to Manure.	Manure Cost per Acre.			Value of Crop per Acre at £10 per Ton.		
		t.	c.	qrs.	t.	c.	qrs.	%	£	s.	d.	£	s.	d.
1	5 cwt. Super. ..	2	13	0	0	6	2	15	1	12	6	26	10	0
2	5 cwt. Blood	2	5	1	—0	1	1	— 2	2	0	0	22	12	6
3	5 cwt. Bonedust ..	2	11	3	0	5	1	11	2	2	6	25	17	6
4	1 cwt. Nit. Soda ..	2	15	2	0	9	0	20	1	0	0	27	15	0
5	No Manure	2	6	2		..		..		..		23	5	0
6	1 cwt. Magnesium Sulp.	1	17	2	—0	9	0	—20	2	0	0	18	15	0
7	5 cwt. Market Garden ..	2	19	2	0	13	0	28	2	0	0	29	15	0
8	5 cwt. Super .. 1 cwt. Sulp. Potash	3	2	0	0	16	0	34	2	14	9	31	0	0
9	5 cwt. Super. 1 cwt. Sulp. Potash 1 cwt. Sulp. Ammonia	2	11	3	0	5	1	11	3	12	9	25	17	6

Minus (—) signifies decrease.

Thorpdale (Childers) Results, 1922-23.

Plot.	Manure per Acre.	Yield.			Increase due to Manure.			Per cent. Increase from Manure.	Manure Cost per Acre.			Value of Crop per Acre at £10 per Ton.		
		t.	c.	qrs.	t.	c.	qrs.	%	£	s.	d.	£	s.	d.
1	5 cwt. Super.	4	17	1	2	13	1	120	1	12	6	48	12	6
2	5 cwt. Super. .. 1 cwt. Sulp. Potash	4	7	1	2	3	1	98	2	14	9	43	12	6
3	5 cwt. Super. .. 1 cwt. Sulp. Ammonia	4	13	0	2	9	0	111	2	10	6	46	10	0
4	No Manure	2	4	0		..		..		..		22	0	0
5	5 cwt. Super. .. 1 cwt. Sulp. Potash 1 cwt. Sulp. Ammonia	6	9	0	4	5	0	193	3	12	9	64	10	0
6	5 cwt. Market Garden ..	5	11	0	3	7	0	154	2	0	0	55	10	0
7	5 cwt. Basic Phosphate	4	9	0	2	5	0	102	1	6	3	44	10	0

It is not possible in any one season to secure data from which a hard-and-fast law of manuring on any given soil or crop may be laid down. This can only be reasoned out from the average of a number of results, and the greater the number from which the average is derived the less margin there is for error in the ruling given.

This must at once be apparent when the climatic variations of seasons, such as temperatures, quantities and times of rainfall, &c., are considered.

Such being the case, the following average table is given to show this season's action and monetary return from manures commonly used. The

trials selected to furnish figures from which averages could be derived are:—Korumburra, Catani, and Thorpdale, for the following reasons:—

I. These three fields are situated in Gippsland, which portion of Victoria supplies the bulk of the potatoes produced in the State.

II. They represent three distinct classes of soil which are typical variations of extensive areas devoted to potato growing.

III. The past season was fairly normal in weather conditions in these three centres.

IV. The manures tested are commonly used by the growers in Gippsland.

The average of the results obtained strongly favour the use (I.) of market-garden manure, and (II.) of a complete compound manure.

Something of a problem presents itself by the fact that sulphate of potash in combination with superphosphate depressed the yield as compared with superphosphate alone, though the combination of superphosphate and potash, plus sulphate of ammonia was one of the outstanding successes. The performance of basic phosphate—a medium grade phosphate manure (none of which is water soluble)— is worthy of notice.

POULTRY NOTES FROM STATE RESEARCH FARM, WERRIBEE.

By W. O. Pederick, Poultry Foreman.

November is the time to cull. Cockerels not required for stud purposes should be disposed of as they become old enough. The growing pullets at the Research Farm are given as much liberty as possible; those on free range do not require meat; a plain dry mash is always available, and they are liberally fed on grain.

Chickens still in the chicken house are given plenty of space; such a precaution is necessary, as overcrowding hinders growth and development. All hens that will not be required for another season's breeding are now being marketed to make room for the growing stock.

With the approach of warmer weather extra green stuff is added to the morning mash, and the layers are fed chaffed green stuff after their grain food at night.

Minced raw onions are mixed with the morning mash at least once a week; this addition helps towards good health amongst the birds.

A sharp look out is kept for vermin, both on the birds and in the houses.

Dust baths are provided and moistened on the warm days.

POMOLOGICAL COMMITTEE OF AUSTRALIA.

REPORT OF ANNUAL MEETING, 1923.

E. E. Pescott, F.L.S., Secretary.

The tenth meeting of the above Committee was held at the Science Branch, Department of Agriculture, on the 5th and 9th May, and continued at Harcourt on 11th May.

There were present:—Messrs. H. Wicks (Chairman), W. Tilling, representing South Australia; J. H. Lang, A. S. Neilson, A. F. Thiele, J. W. Lawrey, J. R. Warren, W. G. Gray, G. Peart, G. Russ, F. W. Vear, J.P., James Lang, J.P., representing Victoria; T. MacMahon, A. Goodhew, representing New South Wales; Hon. L. M. Shoobridge, M.L.C., representing Tasmania. Messrs. W. J. Allen (New South Wales), Geo. Quinn (South Australia), G. W. Wickens (Western Australia), J. N. Ward (Queensland), P. H. Thomas (Tasmania), and E. E. Pescott, F.L.S., Secretary (Victoria) represented the Departments of Agriculture of their States. There were also Mr. Peart, manager of the Shepparton Cannery; Mr. Thompson, representing Henry Jones & Co., of Hobart; Mr. Taylor, representing the Australian Jam Company; Mr. E. Meeking, representing the Quarantine Department; and Messrs. Piggott, M.L.A., Tasmania; and Randall, M.H.A., South Australia; W. Everard, M.L.A., Victoria.

After the President had addressed the members, and the Secretary had read the 1922 report, Lieutenant-Colonel J. H. Lang, V.D., was elected Chairman for the ensuing year.

The Hon. L. M. Shoobridge in an address, briefly outlined the history of the committee and its work, and complimented the committee on now having official representatives from every State in the Commonwealth, representatives of the growers, nurserymen, and canning and jam factories as well.

Sub-Committee Reports.

1. South Australia.

This sub-committee met in January to consider the identity and nomenclature of the Trevatt apricot. Fruits sent from Yanco 1. Settlement, New South Wales, were compared with fruits grown at Blackwood, South Australia, and with fruits of Leewood Perfection, grown at Blackwood. The committee considered that the three fruits were identical, and at Blackwood it was found that they develop and ripen simultaneously. The apricot known as Trevatt should therefore be called Leewood Perfection. This apricot was raised as a seedling from Moorpark, about forty years ago, by the late Edwin Smith, of Leewood Garden, Glen Osmond-road, and Clifton Nurseries, Walkerville.

The sub-committee further reported that comparisons were made between fruits of Trevatt and Blenheim (Shipley's) as grown at Blackwood, and the opinion was that these are in no way identical, either in the character of the fruits, or the seasons of ripening. Further, the Trevatt fruits are quite distinct from the Royal varieties, whether grown from locally procured stock or from trees imported direct from California. The committee formed the opinion from the fruits and the literature of other countries that the variety grown at Blackwood as

Shipley's Blenheim is correctly named, but the tree bearing the name of Blenheim only, received from Hawter, Western Australia, is identical with the Californian Royal.

In the Blackwood collection, besides this tree from Hawter, there are trees labelled Royal, received from H. Wicks, 1908: Californian Royal, from the same nurseryman, received 1908; American Royal, received from Hawter, planted 1908; and simply Royal, from H. Wicks, planted 1908, all of which are identical. The tree at Blackwood labelled Newcastle Early, received from Searle, New South Wales, and planted 1910, is also identical with Royal.

The variety labelled St. Ambroise, received from Nobelius, and planted 1908 at Blackwood (ripe mid-January at Blackwood) is incorrectly named, and has a close resemblance to Moorpark and Heemskirk, though ripening slightly later. The fruit of the St. Ambroise ripens much earlier than this, and is more flattened in shape and higher coloured on exposed side.

Two trees at Blackwood labelled Tilton, one received from Nobelius, and planted 1908, and the other worked from a tree imported direct from Reeding, California, and planted 1915, are distinct in both fruit and foliage. The leaves of the former are more conspicuously serrated, and the stone round and smooth. The stone of the latter is large, flat and rough.

Mr. Allen stated that at Yanco, Trevatt apricots kept longer than Leewood, although the varieties are generally identical.

Mr. Quinn promised to report again next year.

2. New South Wales.

Grunsell's Late Red apple takes woolly aphis, but is free from black spot.

Mill's Late Keeper (Milbert) cropped well at Bathurst, but woolly aphis is showing. This apple keeps out of cool storage until November.

Bonum apple at Bathurst is showing no signs of woolly aphis. The tree crops well, but the fruit is of a dull colour.

Scions of Tenterfield, Royal Snow, Goulburn Beauty, Duke of Wellington, Winter Strawberry apples, and Beauty of Colac pear are all growing well at Bathurst.

3. Victoria.

A meeting was held in January, to consider a new raspberry, Exton Late, and a specimen of Golden Delicious apple received from Stark Brothers, of America, per Mr. J. R. Warren, J.P.

The raspberry, Exton Late, was raised thirteen years ago by Mr. C. Exton, Kinglake. The fruit is larger than the Fillbasket, and commences to ripen just when that variety is finished. Thus the raspberry season is extended for nearly a month. The fruit bunches are carried on a considerable number of axillary clusters. At Kinglake the season extends from about 18th January to 24th February. The sub-committee recommended its approval; and the general committee asked for a fuller report next year, in view of the favorable report.

Stark's Golden Delicious Apple.—Fruits of this apple were sent to Mr. J. R. Warren, by Stark Brothers, of Louisiana, United States of America. The fruit had been submitted to severe travelling tests by

the senders before despatch to Australia. It arrived in excellent condition. The sub-committee reported: "The appearance is most striking; appearance very good, and flesh firm. The quality is very fine and the flavour very good. The apple is not 'Delicious' in shape, and the name may thus be somewhat misleading. The core is exceptionally small for such a large apple." It was recommended that the various State Governments be asked to obtain sample trees for testing in their States.

Plums.—Two seedling Japanese plums, sent by Messrs. A. Chandler and G. Russ, are to be reported upon next year.

General Business.

Black End in Pears.

The question being asked as to what progress had been made in the knowledge of this disease, the Secretary reported that Mr. C. C. Brittlebank, Plant Pathologist, Victoria, had attempted by many cultures to isolate an organism causing the trouble, but had always failed. Mr. Brittlebank suggested that the trouble might be a "stock" one.

Woolly Aphis Reports.

The secretary reported having sent out over one hundred copies of the woolly aphis reports to various societies in the Commonwealth. Very few replies had been received. Among those was one from the Department of Agriculture, Victoria. Mr. Allen's report covered all the varieties in the New South Wales experiment orchards; Mr. Quinn's report covered 1404 varieties grown at Blackwood.

The reports were general that the first season had been a prolific one for woolly aphis. It was agreed that observations be taken each year and noted in conjunction with the season. Reports were general that some tobacco solutions, and especially Black Leaf 40, were the best remedies for this pest. It was considered that "Nicotox" may not be so cheap as this former spray. Soap has been used as a "spreader" in several places with success. In Tasmania the aphis was far worse in the warm and dry districts than in the cold and wet localities.

Parasites of the aphis were discussed, especial reference being made to New Zealand experiences. It was reported that, in the Dominion, parasites were now being freely bred. At the orchard of Mr. W. G. Gray, in Victoria, potash mixed with tobacco water had been used in the dormant season with excellent success. In Tasmania, Mr. Thomas found that a spray of red oil, given as late as possible, using from 1 in 10 to 1 in 15, followed by a spray of Black Leaf 40, in the first arsenate of lead spray gave good results.

Mr. Wicks considered that a second spray within 24 hours cleared the trees of aphis. The Chairman, speaking of oil applications, said that in his experience crude petroleum and lime, using 1 lb. lime and 1 gallon of petroleum to 25 gallons of water, was more effective than red oil.

The question of using nitrate of soda or salt sprays was considered, but doubts were expressed as to their value.

The Ettersburgh Strawberry.

Tasmania asked for a report on this berry. The opinion, after discussion, was expressed that the first Ettersburgh Strawberry distributed in Australia, No. 80, the so-called "tree" strawberry, was a prolific cropper, but only a jam berry, and it is not recommended for general planting. Ettersburgh No. 89 is strongly recommended for trial, and for future reports.

Fruit Tree Stocks.

The committee decided to recommend that an arrangement be made between the States for some detailed system of investigation into the best stocks for fruit trees.

Mr. Quinn reported that in regard to seedling apple stocks, seedlings are very erratic and show great variation. At Blackwood 340 plum varieties are worked on to the seedling Myrabolan. At Berri, Fellemberg proved very unsatisfactory on this stock, and in many cases, the trees outgrew the stock in diameter.

There are 1,000 varieties of pears at Blackwood, all worked on seedling stocks; many trees are evidently not suited to this stock. It is not yet known whether variation of the stock is the cause.

At Berri a trial of citrus stocks is proceeding. Three trees of each of the following varieties are worked on each stock as follows:—

Variety—

Thompsons, on lemon seedlings.

Navelencia, on sweet orange seedlings.

Buckeye Navel, on Pomelo seedlings.

Mediterranean Sweet, on Poor Man seedlings.

Dancey's Tangerine, on Seville seedlings.

Valencia Late, on Trifoliata seedlings.

Some of the trees are from nine and ten years old. The trees on lemon seedlings are more vigorous and produce more and larger fruit than those on orange seedlings. Those on the other stocks are not yet in bearing. The varieties on *Citrus trifoliata* are doing well.

In cherries, five leading commercial varieties are worked, three trees of each, on Mazzard, Mahaleb, and Kentish stock, and on Mazzard seedlings with Kentish worked as an intermediary. The trees on Mazzard stock, almost without exception, are strong and vigorous, and fair croppers. The Kentish stock gives a moderate sized tree, and good fruit, but the stock suckers regularly and freely. Owing to this suckering the Mazzard was used in the fourth trial, on account of its strong roots, with the intervening piece of Kentish wood, to slightly stunt the tree. A full report will shortly be published.

Mr. Thiele reported that at Doncaster, Victoria, Williams pears —worked on rooted cuttings of Williams—gave a good root system, good spur system, and good crops. Citrus trees are thriving well on *Citrus trifoliata* stock.

Colour Sports of Fruits.

The question of colour sports, especially those from the Rome Beauty apple, was considered for the third time by the committee. Several sports of Rome Beauty have been shown at the meetings. These are Glengyle, Croydon, Panton Hill, Herbert's, Harcourt (all Red Romes); and two from America, Ohio and Washington, both Red Romes. The three latter were considered the finer samples; but the sport from Harcourt, selected by the grower, Mr. C. H. Seelenmeyer, was considered to be the finest of all.

Other colour sports exhibited and discussed were, Red Northern Spy, from Mr. J. Johnstone, Stanley, Victoria; Red Jonathan, from Mr. W. Moyle, Upper Pakenham, Victoria; Red Delicious, from Mr. Frank Walker, Launceston, Tasmania. It was agreed that no colour sport should be known as a separate variety, and the following resolution was carried:—"That Nurserymen's and Horticultural Associations be notified that the Pomological Committee does not recognize colour sports of apples as distinct varieties, and that they be requested to catalogue them only as sports of a particular variety."

Regarding the Red Delicious sport shown for the first time, it was decided that the committee favorably considers this sport, and that a report be given as to its condition next year.

Rome Beauty Apple.

This apple was unfavorably commented upon at the 1922 Conference. The following reports were received this year:—

Mr. Wickens wrote to all Associations in Western Australia, as well as to principal growers in apple growing districts, regarding its value. The replies were unanimous that it was decreasing in favour each year, owing to its susceptibility to woolly aphis. It is also the variety most susceptible to powdery mildew. Growers are planting Granny Smith and Yates in its place.

Mr. Ward reported that growers at Stanthorpe, in Queensland, were working Rome Beauty over to other varieties on account of powdery mildew and woolly aphis.

Mr. Allen stated that in New South Wales the Rome Beauty on the heavier soils lacked colour. The fruit grows too large for Sydney markets.

Mr. Thiele reported that it is grown generally in Victoria, and is one of the best croppers. It is hardy; takes woolly aphis; but has the advantages of a long stem and a good colour.

Mr. Quinn reported that it is grown widely in the cold districts of South Australia, and is recognized as one of the long-keeping cold-storage varieties.

The Chairman reported that in Harcourt it was one of the best varieties grown. In 1922 he had harvested 400 bushels from one acre, and 600 bushels in 1923 from the same acre. He had had Romes 44 to the bushel case in 1923. The great advantage of the Rome Beauty was that with it one received the benefit of the late markets and high prices.

Citrus Nomenclature.

It was decided that at the 1924 meeting the subject of citrus varieties would be specially considered, and that the co-operation of the growers, nurserymen and Agriculture Departments be invited. It was was also decided that the officers of the citrus-growing States hold special sub-committee meetings this year, and report in 1924 on nomenclature, stocks and other points in citrus culture, including citrus stocks.

Consideration of Seedlings.

1. A letter was read from Mr. F. J. Kellaway, of Tasmania, refusing to allow the distribution of wood of his seedling apple for propagation purposes. A motion was carried, that Mr. Kellaway be again urged, in the cause of public utility, to distribute a stock of the wood.

2. Three apples were sent by Mr. H. R. Wright, nurseryman, Auckland, New Zealand—

(*a*) A seedling apple from Delicious (female) x Cox's Orange (male). Tree a strong sturdy grower, and blight proof. Fruit a good keeper. Colour good, flavour very good. Stem rather short.

(*b*) A seedling apple from Ribston Pippin (female) x Northern Spy. Tree a vigorous grower and a heavy cropper, resembles the Northern Spy in habit, and is blight proof.

(*c*) A dull-coloured sport of (*b*).

The raiser reported that (*b*) will hang on the tree until June, while (*a*) can be gathered in March.

The committee reviewed (*a*) and (*b*) very favorably, and decided to see them again next year; (*c*) is not suited for growing.

3. "King Cole." This apple was formerly known as Cole's Champion. It was reported as a good cropper, from the North-East of Victoria, and from Bairnsdale. Mr. Gray said that at Hurstbridge he had noticed a little woolly aphis on the tree. The committee decided not to recommend it for planting at present, but to see it again next year.

4. Ellison's Orange Apple, sent from Mount Barker, Western Australia. An English apple, evidently not suited to Australia. It is not recommended for planting.

5. Pickering Plum. A plum grown at Mitcham, Victoria, and raised by the late Mr. Pickering. It is a good keeper, and of fine flavour, very dark, and not quite so large as President. It was agreed to view it next year and compare it with President.

6. Seedling plum, grown by Mr. A. F. Thiele, Doncaster, Victoria, a chance seedling; recommended by the committee as a late plum; a good cropper, sweet and fine flavour; reported as the best plum of April-May. To be named.

The committee decided to again view the following fruits in 1924:—

Seedling pear, A. B. Robin, Nuriootpa, South Australia.
Seedling apple, J. Lang, Harcourt, Victoria.
Seedling pear, J. Lang, Harcourt, Victoria.
Seedling apple, "Milbert," New South Wales.
Seedling apple, No. 6, Mr. J. Bulman, Freshwater Point, Tasmania, a seedling from Worcester Pearmain.
Seedling apple, Mr. M. Yeoland, Littleton, Tasmania.
Seedling apple, No. 8, Mr. J. Bulman, Tasmania.
Seedling pear, C. H. Seelenmeyer, Harcourt.
Seedling peach, cling No. 2, Mr. A. F. Thiele, Doncaster.
Seedling pear, Mr. C. F. Cole, Wangaratta.
Seedling passion fruit, Mr. A. F. Thiele, Doncaster.
Seedling apple, Mr. A. F. Thiele, Doncaster.
Sport apple, Red Spy, Mr. Johnstone, Stanley, Victoria.
Seedling apple, J. Grunsell, New South Wales.
Lang's Best and Bess Pool apples, for comparison.

The committee decided that the following fruits were not superior to other varieties:—

Barossa apple, seedling No. 7.
Ferndale apple, Mr. J. Bulman, Tasmania.
Seedling pear from Bathurst Orchard, New South Wales.
Seedling peach, cling No. 1, A. F. Thiele, Doncaster.
Seedling apple, A.N. 47.
Seedling apple, Mr. H. J. Rumsey, Dundas, New South Wales.

Tomato Wilt.

Mr. Thomas presented a report on four varieties of American tomatoes which were distributed from the Department of Agriculture in Washington, United States of America. In Tasmania, Marvel and Norduke proved anything but wilt-resistant. None of the varieties this year proved good commercial types.

The Secretary reported that Mr. Brittlebank had again failed to isolate any organism causing spotted wilt. The Burnley experiments were being continued, and Mr. Rae, the Principal at Burnley, was carrying out breeding experiments, using the currant tomato, which is wilt-resistant, as the base of the experimental work.

Mr. Wicks reported that he had seen the currant tomato in abundance in the South Sea Islands last year, and it was never wilted, while other varieties were.

Mr. Quinn reported that the tomato wilt does not appear every year with the same virulence. He had grown twelve plants of twelve varieties, and from one to three plants of all varieties had been attacked. He had obtained fruits from five of the twelve varieties from diseased plants. Seeds were sown from fruit obtained from plants that had died from wilt. In 1921-22 the plants from these seeds were quite free from wilt. There were acres of tomatoes grown under glass in South Australia. Plants from the same seed-bed were grown outside as well as inside, and in the same soil with the same irrigation, and the glass-house-grown plants had never shown wilt. Mr. Quinn said he had seen a tomato plant, portion of which had grown through a broken pane, and the part of the plant that grew outside was badly wilted, while the parts inside were quite free. Wilt always appeared when there was a great drop in the temperature.

If the weather became warm and remained at an even temperature, the plants seemed to hold their own, but with a cold check another attack supervened. It would appear that the sudden drops and rises in temperature were more the cause of the wilt than anything else, and that the cause was probably physiological.

Mr. G. Peart saw the American tomatoes grown by Mr. Hutchinson, at Tatura, Victoria. Marvel did not look a good tomato, but none of the four took wilt this year. The varieties were Marvel, Norduke, Columbia and Norton. Early tomatoes, in his experience, take wilt while late-planted ones rarely take it.

It was decided that all States make observations for next year.

Elimination of Undesirable Varieties from Nurserymen's Catalogues.

The Secretary reported that the Australian nurserymen were unanimous in eliminating the names of undesirable types of fruit from their lists, and that some had already reduced their catalogues by a number of pages. The following motions were carried:—(*a*) That nurserymen be invited to indicate on their catalogues the varieties of fruit approved of by the Pomological Committee. (*b*) That each cannery and jam factory be written to, asking what fruit varieties they prefer for canning and jam-making; indicating peaches, pears, plums, and apricots. (*c*) That the matter of elimination of varieties be left to the nurserymen to deal with in conference. (*d*) That when making recommendation in catalogues, nurserymen urge intending planters to seek information locally before planting.

Fruit for Canning and Jams.

Messrs. Peart, manager Shepparton Cannery, Thompson, of H. Jones & Company, Hobart, Taylor, of the Australian Jam Company, and Carey, Commonwealth Inspector, were present.

Mr. Thompson reported that at Hobart no peaches were canned. The only two varieties of pears generally used for canning were Williams and Kieffer. Sometimes a few of the Napoleon (Vicar of Winkfield) variety were canned at the end of the season. This pear, however, was an unsatisfactory one to grow, as the fruit was inclined to drop from the tree, and consequently was often picked when too green. Further, it was somewhat hard for canning, and did not keep so well after canning as Williams.

Of apricots, Mr. Thompson said Moorpark was at a discount owing to Federal regulations. In addition, the fruit ripened unevenly. Oullins, he said, was not a prolific variety in Tasmania.

Blue Imperatrice was the only plum recommended in Tasmania for jam.

Mr. Taylor said that the Williams was the only pear suitable for canning. The flavour of Packham's Triumph was not good enough to make it a satisfactory fruit for canning, and he would not recommend Vicar of Winkfield. Only a few Kieffers, he said, were canned.

Mr. Taylor said the Moorpark apricot seemed to ripen unevenly everywhere, except at Geelong. Blenheim he described as the best canner for Victorian conditions. The Australian Jam Company had tried a few Tilton's—a late variety with a beautiful colour.

Mr. Wicks gave the order of ripening of apricots in South Australia as follows:—Newcastle (neither good for drying or canning),

Oullins, Blenheim, Late Riverside, Californian Royal, Heemskirk, and Moorpark. Red Maskelyne was the earliest of all but it was rarely grown. The Royal must be short spur pruned to be productive.

Mr. Carey said he could not recommend Moorpark for canning. Peaches, he said, ripened in the following order:—Tuscan, Sims, Phillips, Goodman, Golden Queen, Pullar's Cling. In the Goulburn Valley, Goodman's Choice ripens about 25th February.

Mr. W. J. Allen reported the following dates of ripening of peaches: —Leader, 14th January; Levis, 16th January; Pelora, 20th January; Sims, 19th February; Phillips, 13th March; Golden Queen and Goodman's Choice, 15th March; sometimes Phillips ripens about 1st March.

Mr. G. Peart reported that Phillips Cling may be picked progressively for three weeks.

Mr. Quinn described the Royal apricot as a hardy variety, and even though the fruit fell from the tree it would not be injured. It was a more even ripener than Moorpark, though Moorpark was the better of the two for drying. Royals worked on peach stock at Blackwood were bearing up to ten bushels per tree.

Mr. Peart, manager of the Shepparton Canning Company, reported that while the Royal apricot was good for the Goulburn Valley, Shipley's and Tilton were the best. Kaisha had not yet been tried out. It was showing well, and yielded nice large fruit of even size, but the quality was not good.

Mr. Peart said that the Tuscan peach in the Goulburn Valley seemed inclined to develop into two kinds—one of them of very poor quality. Levis Cling had not yet been fully tested, but if it fulfilled its promise it would be largely used. Nichols Orange Cling "ragged freely, and consequently was not suitable for canning. Phillips, described as a beautiful peach and the best canner in 1923, was of good size and nicely coloured with red around the pit. Goodman's Choice, which ripens between 28th February and 1st March, was thought to be one of the best. He considered the days of Pullar's Cling were over. The stone in this fruit was too big, and was as big in a $2\frac{1}{4}$-inch peach as in one $3\frac{1}{4}$ inches in diameter. Moreover, the fruit was too large. What was wanted for the English market was a peach that would go about ten halves to the can. Australia could not compete with California with a coarse peach like Pullar's. It started to ripen about 8th March, and this year lasted for five or six weeks, which was its only advantage.

Mr. Peart said he regarded Williams as the only pear suitable for canning. Packham's Triumph took too long to ripen, and ripened unevenly. After canning, the flesh turned mealy, and the syrup became thick and discoloured. Beurre Bosc came next to Williams, and Kieffer was not so good, while Vicar of Winkfield was not favoured.

A vote of thanks to the canning representatives, coupled with a suggestion that the Minister of Customs should make public the report of the Commonwealth Inspector of the fruit pack for 1923, was agreed to.

Australian Blueberry.

For the protection of the grower and consumer, it was decided: "That it be recommended to the various State Departments to investigate the 'Australian Blueberry,' and other new fruits as advertised, with a vew to ascertaining the true nomenclature and breeding of these advertised novelties."

ABBREVIATION OF NAMES OF VARIETIES FOR BRANDING PURPOSES.

The meeting at Harcourt decided on the following abbreviations of the names of varieties of commercial fruits, for branding purposes, exported to either overseas or interstate markets:—

1923.

1. With short names, such as Fanny, Rymer, Dunns, Tasma, Yates, Howell, and others, it is optional to use either the abbreviations or the full name.

2. Initial letter of letters to be in capitals, other letters to be small.

3. The stroke sign / denotes "of" or "de."

4. Apples to be branded in black, pears in red, or in white if jarrah cases are used.

APPLES.

Alfriston	Alf	Lord Suffield	L S d
Adam's Pearmain	A P m	London Pippin	L P n
Allington	A l n	Lord Wolseley	L W y
Alexander	A l x	McIntosh Red	McI R
Aromatic	A r o	Mobb's Codlin	Mob C
Bismarck	B m k	Nickajack	N j k
Ben Davis	B D s	Newtown Pippin	N P n
Buncombe	B e m	Perfection	P f n
Commerce	C o m	Prince Alfred	P A d
Crow's Egg	C E g	Ranelagh	R a n
Cleopatra	C l e o	Rienette de Canada	R/C
Cox's Orange Pippin	C.O.P.	Ribston Pippin	R P n
Crofton	C f n	Rokewood	R k d
Delicious	D e l	Rome Beauty	R B y
Dougherty	D h t y	Rymer	Rymer
Duke of Clarence	D/C	Spitzenberg	S p t z
Dunn's	Dunn's	Scarlet Pearmain	S P m
Dumelow (Wellington Pippin)	D m l	Sturmer Pippin	St P
		Scarlet Nonpareil	S N p
Fameuse (Lady in Snow) (Pomme de Niege)	F a m	Senator	S e n
		Stone Pippin	Stone P
Fanny	F n y	Strawberry Pippin (Winter Strawberry)	Str Pn
Foster	F o s		
French Crab	F C b	Statesman	S t m n
Granny Smith	G r S	Stayman (Stayman Wine-sap)	Sty W
Gravenstein	G r a v		
Hoover	H v r	Tasman's Pride	Tas P
Jonathan	J o n	Tasma	Tasma
King David	K D v	Worcester Pearmain	W P m
King of Pippins	K/P	Yates	Yates

PEARS.

Beurre Bosc	B Bosc	Gansel's Bergamot	Gan B
Beurre Clairgeau	B C g u	Giblin	G b n
Beurre de'Anjou	B/A	Glou Morceau	G l M
Beurre de'Capiaumont	B/Cap	Howell	H w l
Beurre Diel	B Diel	Josephine de Malines	Jos/M
Beurre Easter	B East	Keiffer	K f r
Beurre Hardy	B Hdy	Madame Cole	M Cole
Beurre Superfine	B Sfn	Marie Louise	M L
Black Achan	B Ach	Packham's Triumph	P k T
Broompark	B P k	Vicar of Winkfield (Napoleon)	V/W
Clapp's Favourite	Clp F		
Conference	Conf	Williams	W B C
Doyenne du Comice	D/C	Winter Cole	W Cole
Duchesse d'Angouleme	D/A.	Winter Nelis	W Nelis

It was decided to endeavour to hold the next meeting in Hobart, Tasmania, about the last week in April, 1924.

THE VALUE OF FRUIT AS AN ARTICLE OF DIET.*

By Dr. J. H. L. Cumpston, Director-General of Health.

Before any estimate of the value of any particular article of food can be attempted, it is essential to obtain a clear idea of the reasons why food is necessary, of the requirements that a perfect article of food must satisfy, and of the way in which food becomes available for use by the body.

The Reasons why Food is Necessary.

Without discussing too fully the intricacies of the subject, it may be accepted that the discharge of all the functions of the body—the beating of the heart, the processes of thought, the contractions of muscles which cause movements, and so on—can only be accomplished by the expenditure of a certain amount of energy. This energy is provided by a corresponding actual loss of substance by the body tissues. Therefore to make good this loss of substance, which goes on incessantly from the moment of conception till the hour of death, and to thus maintain the body in normal working condition, fresh supplies of material must be forthcoming. The food we eat provides the supply. While this actual loss of substance must be made good, there is also during the earlier periods of life a constant growth of all parts of the body. So that the food must be supplied with the double object of replenishing the loss by "wear and tear," and also enabling the body to grow.

The Requirements that a Perfect Article of Food must Satisfy.

In the first place, as has just been said, the substance actually lost must be replaced. So that the first point to be considered is to ascertain quite clearly what substances are lost from the body as a result of the performance of its functions. This has been experimentally investigated, and is now quite decided. The avenues by which the loss occurs are the lungs, the skin, the kidneys, and—to a less extent—the bowels. Analysis of these waste products shows that they consist almost entirely of four chemical elements—carbon, hydrogen, oxygen, and nitrogen—and that the proportions of these various substances remain fairly constant. Therefore, the main problem to be solved is how to supply these four elements in the proper proportions.

Food in the forms in which it is universally taken may be classified under five definite heads, according to its composition. These groups are named as follow:—Proteids, carbohydrates, fats, salts, and water. Of these, water, a familiar enough substance, plays the most important part. The proteid group is the only one of these which contains the necessary nitrogen, and may be represented by the white of an egg, which is the purest form of proteid among the common articles of diet. The lean part of meat is another example of a proteid form of food. The term "fats" sufficiently explains itself—butter and the fat of meat are common examples. Carbohydrates are

* Reprinted with some slight amendment from the *Journal of Agriculture* for April, 1913.

a group of substances all alike in chemical composition, but somewhat unlike in the forms in which they are familiar to us. Potatoes, flour, and sugar are all examples of the carbohydrate type of food. Salts form a small portion of food; there are a large number of them, and the most familiar example is ordinary table salt.

So that, in an ordinary breakfast, the chop is the proteid, the bread and the sugar in the jam are carbohydrates, the butter is the fat, the salt is used with the chop, and the water is provided by the tea.

As proteids are the only food substances which contain nitrogen, it is obvious that life could not be maintained unless proteids are taken. Proteids, however, contain less carbon than nitrogen, so that if proteids alone were eaten in order to obtain the necessary amount of carbon, far too much nitrogen would be taken. A mixed diet is therefore absolutely necessary, and for other reasons a mixed diet, such as is usually taken, containing all five groups of substances, has been shown to be the most satisfactory. Science has thus been able to prove in this century that mankind has been eating the proper kinds of food since the beginning of time.

The Ways in which Food becomes Available for use by the Body.

For the food substances to be of any use to the body tissues, to the muscles for example, it must be carried to the muscles by the blood. To get into the blood, it must pass through the walls of the intestines in a liquid or dissolved form. Obviously, in the form in which food is taken into the mouth, it would be absolutely impossible for it to pass through the walls of the intestines. Therefore, the digestive apparatus has been provided. The teeth break up the food into small particles; then the digestive juices in the mouth, stomach, and intestines mix with the food and chemically change it, dissolving it and ultimately coverting it in such a way that it can pass through into the blood and be at once available for use by the tissues. It has been long understood that unless each minutest part of the food is reached and acted upon by the digestive juices the process of digestion will not be complete.

Having then considered food in general, it becomes possible now to discuss fruit in particular, and to attempt to estimate the value of this class of foodstuff. In the first place, are the different groups of food substances which have been shown to be necessary contained in fruits, and if so in what proportions are they present? Considering the commoner varieties of fruits—apples, pears, plums, peaches, apricots, cherries, grapes, gooseberries, currants, &c.—it is found that these contain about 85 per cent. of water, a very low proportion of proteids, a moderate amount of carbohydrates, and in addition to these a considerable proportion of vegetable acids and of salts. They contain no fats. The fact that fruits contain a low proportion of proteids at once makes it clear that the fruit would not be sufficient by itself to carry on the work of the body; but as fruit contains carbohydrates, salts, and a large amount of water, it takes its place as a possible constituent in a mixed diet. The fact that the carbohydrates and salts are, to a large extent, contained in the water, *i.e.*, as juice, and are thus present

in a readily available form, greatly adds to the value of this form of diet. In short it is evident that fruit by itself is insufficient to maintain life for any prolonged period, that it takes its place along with an infinite variety of other foods as a pleasant and palatable form in which some of the necessary food substances may be taken; but that, unless it can be shown that fruit has in itself a special quality which is not possessed by other foods, then it must be considered that fruit is not an indispensable article of diet.

Has Fruit such a Quality?

Let me remind you of what is a familiar fact—that outbreaks of scurvy on shipboard very rarely occur when the ship is provided with a sufficient supply of fresh limejuice. Without entering at any length into the theory of the question, it may be said that scurvy, and some other diseases, are almost certainly due to the absence from the diet of certain vital constituents of fruit and vegetables, and that, if the body be deprived for any prolonged period of these vital food factors, then a definite derangement of health, such as scurvy, rickets, or beri-beri, will accrue, and the fact may be accepted that the absence of fresh fruit or fresh fruit juices from the diet may lead to considerable derangement of health.

In another direction fruit plays a very useful part. If a small piece of meat is placed in the juice of a fresh pineapple, the meat will gradually disappear—it is digested by a special constituent of pineapple juice. This special principle is called a ferment. Such ferments are present in all fresh fruits, and play a very considerable part in maintaining normal health. In still a third direction fruit has a special value. The cells of all varieties of fruit are encased in a fine envelope of woody fibre, known as cellulose. This is indigestible, and without producing the abnormal condition known as indigestion, it stimulates the walls of the intestines, increasing their activity, and so preventing constipation. This tendency is assisted by the large proportion of salts present in the juices, so that fruit is especially valuable in preventing constipation and assisting normal and regular digestion.

There is no doubt then that fruit has a special value as an article of diet, and is therefore practically indispensable. Particularly is this true in tropical and semi-tropical countries. The conditions of life in these countries are such that fruit is of almost inestimable value in the preservation of health. Different climates demand different diets. The Esquimaux find it necessary to consume enormous quantities of meat, and practically no other kinds of food. From this extreme gradations are observed, until the races in tropical countries live almost entirely on fruit and grain, and have a minimum of flesh foods. In these States the climate is tropical and semi-tropical, and temperate, and it should be emphasized that here the more fruit a man eats the better will his health be.

A word as to the effect of cooking on fruits. In cooking, the cellulose walls of the cells are ruptured and the cell contents escape, so that it is more easy for the digestive juices to mix with cooked fruit than with raw, and therefore digestion is easier. On the other hand, most of the valuable constituents of fruit are present in the

juice, and this becomes largely available during mastication, so that the necessity for perfect digestion is not so great as with some other foods. Further, the effect of cooking is to destroy the ferments, and so one of the most valuable constituents of fruit is lost. Therefore, while cooked and preserved fruits are good, raw fruit is probably a great deal better.

To sum up the position, then: Fruit contains some of the necessary constituents of all foods, and is therefore and by reason of its palatability, of general value; it contains certain special principles which are necessary to the body, and is therefore indispensable; it is of greater value in the raw than in the cooked state; it is of especial value in tropical and sub-tropical countries.

In view of these facts, it is obvious that an abundant supply of fresh fruit, sold at such prices as to be available to all, is an absolute necessity in a place with a climate such as we have.

While the reasons for it may be open to discussion, yet this fact is undeniable, that the price of fruit is maintained at such a level as to place it beyond the reach of those to whom an abundant supply would be most valuable. If it be that the fruit market is being financially exploited by the few to the detriment of the many, then these few should be forcibly reminded that financial exploitation of goods is less defensible when it controls foodstuffs needed by the people than in any other field of operations, and must inevitably bring about its own adjustment. Whatever be the direction in which the reform is called for, it is to be hoped that before long such steps will have been taken that the general public will have been provided with a sufficient supply of wholesome fresh fruit at a reasonable price.

THE COMPOSITION OF FRUITS.

The following analyses of some of the commoner fruits are taken from a work, *Food Inspection and Analysis*, by A. E. Leach, S.B., of the United States Department of Agriculture.

The analysis in each case is that for the edible portion of the fruit.

Fruit.	Water.	Protein.	Fat.	Total Carbohydrates.	Crude Fibre.	Ash.	Fuel Value per Pound Calories.
Apples ..	84·6	0·4	0·5	14·2	1·2	0·3	290
Apricots ..	85·0	1·1	..	13·4	..	0·5	270
Cherries ..	80·9	1·0	0·8	16·7	0·2	0·6	365
Grapes ..	77·4	1·3	1·6	19·2	4·3	0·5	450
Lemons ..	89·3	1·0	0·7	8·5	1·1	0·5	205
Oranges ..	86·9	0·8	0·2	11·6	..	0·5	240
Pears ..	84·4	0·6	0·5	14·1	2·7	0·4	295
Pineapples ..	89·3	0·4	0·3	9·7	0·4	0·3	200
Plums ..	78·4	1·0	..	20·1	..	0·5	395

OIDIUM OF THE VINE.

Uncinula Spiralis (Berkeley & Cooke).

By F. de Castella, Government Viticulturist, and C. C. Brittlebank, Government Pathologist.

Of all fungous diseases which attack the vine, Oidium, or Powdery Mildew, as it is called in America, is the most familiar. Fortunately, it is also the easiest to control; unlike other vine fungi, it yields to curative treatment such as would be hopelessly ineffective in the case of Downy Mildew or Black Spot.

Its virulence can, nevertheless, be very great in the absence of treatment and under climatic conditions which suit it. Shortly after its first appearance in France, and before the discovery of sulphur as a specific for its control, it constituted a disaster of the first magnitude, frequently entailing the loss of the greater part of the grape crop.

In Australia, especially in the warm inland districts, thanks to our drier atmosphere, it is seldom capable of such havoc. In some localities and seasons, however, it may cause serious loss, and information concerning its life history and methods of treatment will be found useful.

Historical.

Unlike Black Spot, which has been known in European vineyards since remote antiquity, Oidium is a comparative new comer. It was unwittingly imported into Europe from North America, where it is indigenous. It was first noted in England by Tucker, on vines grown under glass at Margate, near London, in 1845. It was not found in France until 1847, when it appeared, also on vines under glass, on M. J. de Rothschild's property at Suresnes, near Paris. The following year it was found on all vines under glass in Northern France, and occasionally in neighbouring vineyards. In 1850 it seems to have made its first appearance in the south of France (Lunel) and near Bordeaux, as well as at a few points in Spain and Italy. By 1851 all vineyards in France were invaded, as well as those of such Mediterranean countries as Spain, Italy, Greece, Syria, Asia Minor, Algeria, and Hungary. Damage was only severe in a few localities. In 1852 and 1853 disastrous outbreaks occurred in several southern French vineyards and at Bordeaux. In 1854 the ravages of the disease were such as to cause a panic among vine-growers. Sulphuring, which was first applied in England in 1846, came into general use. The new disease was mastered, and soon ceased to be feared by careful growers.

In the rapidity of its spread, Oidium much resembles Downy Mildew. The date of its first appearance in Australia is not easy to fix, but Oidium has been known in every district where vines are grown for very many years past. It is worthy of note that this disease seems to be now much less prevalent in Victoria than it was a couple of decades ago. Sulphuring, which was generally practised then, is now often dispensed with in the Murray Valley, without serious damage resulting. The reason for this decrease in severity is not very apparent. It is, no doubt, due to some change in our climate, resulting in reduced humidity in the atmosphere.

Conditions Favorable to Oidium.

Like all fungi, Oidium needs both heat and moisture for its development. It is less exacting than Downy Mildew as regards the former, being able to develop in sheltered situations at temperatures of from 50 deg. to 54 deg. F. It is thus able to make its appearance very early in the season, soon after the first sprouting of the vines.

The miniumum temperature needed for its development seems to be between 41 deg. and 50 deg. F., and the optimum, between 77 deg. and 86.* Marès found its growth to slacken down very much at 95 deg., becoming almost stationary up to 104 deg., at which temperature it is destroyed.

Moisture is needed in the form of atmospheric humidity, and not as rain or dewdrops, so indispensible for the infection of the vine by Downy Mildew and Black Spot; without raindrops there can be no spore germination of these fungi. The Oidium spore, on the contrary, can germinate in moist air; it does not need the drop of water.

Sultry conditions favour Oidium. Dull, cloudy weather, which is at the same time warm, is ideal for its spread. Hot, dry years, provided the atmosphere be humid or muggy, are favorable to the development of Powdery Mildew and wet years to that of Downy Mildew.

Severe Oidium outbreaks may occur without any rain at all. Heavy rain, especially if cold, may even hinder the disease, by washing off a good many spores. The moist, steamy conditions which follow the downpour permit the disease to resume its virulence unless checked by sulphur.

Opposite conditions, such as bright sunny days with crisp dry air, are altogether unsuitable for Oidium.

According to Viala, "warmth is the preponderant factor; thus, on dry, hill sides which quickly become warm, and on shallow, red, stony and sandy soils, where growth starts early, Oidium does much more damage than on flat land which is moist and cold.† On the banks of rivers and near the sea-shore, under the influence of fogs and mists on damp flat land, the disease only becomes serious when the temperature is fairly warm.

The presence of weeds and cover crops, as well as freshly-worked land, render the supernatant air more moist; they therefore favour this as well as other fungi.

Irrigation intensifies the prevalence of Oidium. This influence is more particularly noticeable in large irrigation settlements where a considerable extent of country is regularly watered. It is only in such, that any notable increase in atmospheric humidity could be expected.

Vines trained on high trellises and against walls are more severely attacked than those trained nearer to the ground and grown in the open. The proximity of large trees, which reduces liability to Downy Mildew, has a contrary influence so far as Oidium is concerned.

The liability of localities with a humid atmosphere, was strongly exemplified in Madeira. Shortly after its first appearance in the island

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* Viala, Les Maladies de la Vigne.

† It is no doubt for this reason that Oidium is usually found on the east side of the vines in a vineyard, *i.e.*, the side exposed to the rising sun—a fact well known to older vignerons.

it seemed as though vine culture were doomed. Many vineyards were eradicated, so hopeless did control appear before the discovery of sulphur as a specific. The disaster of 1851 at Madeira is often quoted as an example of what this fungus is capable of.

Influence of Variety.

This is very considerable, some sorts are extremely liable, whilst others show a marked degree of resistance. One of the most susceptible varieties is Verdeilho. In vineyards where this vine is grown it is well to keep a watch on it for the first symptoms of the disease. The drying grapes—Sultana, Zante Currant, and Gordo Blanco—are very liable to Oidium, as are also most table grapes. Ohanez is very badly attacked.

Viala lists the following sorts as being very liable to Oidium:—

Muscats in general, Chasselas, Black Hamburg, Malvoisies, Teinturier, Folle Blanche, Clairettes, Picpoul, Gamay, Cabernet, Brun-Fourca, Syra or Shiraz, Roussanne, Riesling, Carignane, Pascal Noir, Sicilien, Ugni blanc (wrongly called White Hermitage here), Tibouren, Terret, Œillade, and Cinsaut.

And as less liable:—

Aramon, Sauvignon (white), Marsanne, Dolceto, Colombaud, Grenache, Espar (Mataro), Morrastel, Petit Bouschet, Bourboulenque, and Pinots.

Very seldom attacked are:—

Cot (Malbeck), Melon, Calitor, and several Vinifera x American hybrids.

Resistant stocks, in fact American species in a general way, suffer much less than Vinifera varieties. It was this resistance to Oidium of Isabella (a Labrusca x Vinifera hybrid) which led to its extensive planting in Italy shortly after the first appearance of Oidium in that country.

Professor Bioletti mentions several of the above-named susceptible sorts with the additions of Flame Tokay. He lists, as being more resistant, the following:—Beclan, Duriff, Alicante Bouschet, and Vernaccia.

Outward Appearance.

The outward appearance of Oidium is so well known and so characteristic as to scarcely need detailed description. All green, growing parts of the vine are liable to attack—leaves, canes, embryo bunches, tendrils, &c.—on these it manifests itself as a very fine dusty film which gradually becomes greyish and presents a typical faint mouldy smell. (See Fig. 1.) The American common name of Powdery Mildew describes it very aptly, and at once distinguishes it from Downy Mildew. There is no possibility of confusion between the two. The patches of the latter fungus consist of a white and glistening "down" on the leaves, they only appear on the under side, and are altogether distinct from the usually slight, diffuse, dusty film of Oidium which is most noticeable on the glossy upper side though it is present below also. In severe cases the Oidium patches may become fairly thick; they are then greyish in appearance, and quite different from the glistening white down of the other mildew. (See Fig. 1.) The Oidium patches gradually assume a

darker appearance, and if rubbed off with the finger this will be seen to be due to black markings of the outer skin, the surface cells of which have been injured by the fungus. This is particularly noticeable after the fungus has been killed by sulphur. The somewhat blackened appearance of the vines a day or two after sulphuring is welcomed by practical vignerons, who take it as an indication that the treatment has effectually

Fig. 1.—Oidium or Powdery Mildew of the Vine.

Upper Part.—Usual appearance of attacked vine. The grey powdery or mealy appearance is difficult to represent graphically. The immature berries are splitting as a result of fungus injury.

Lower Portion.—A speck of infected surface on a berry highly magnified. The net-work, or felt, of Mycelium, creeping over the surface sends up more or less erect conidiophores, which bear the conidia or summer spores

Middle Portion.—Spore-bearing body (pycnidium) of *cicinnobolus cesatii*, a parasite fungus sometimes found on Oidium.

killed the fungus. These black markings may rather spoil the appearance of table grapes. On the canes they may be branched and fern like, or merely mottled. The markings thus left on the ripened canes in winter are sometimes mistaken for Anthracnose (Black Spot) scars. There is a great difference between the two, however, Anthracnose scars are sunken in the depressed centre being usually surrounded

by a more or less swollen rim. The markings left by Oidium are discoloured, sometimes even rough, with minute black prominent specks all over them, but the surface is always flush; there is no central depression. (See Fig. 2.) If the canes are quite young when attacked, or in the shoot stage, they may dry up altogether; later on they may fail to ripen properly, being thus rendered useless as pruning wood.

Young leaves severely attacked cease growing, and are deformed; these and also adult leaves are rendered incapable of functioning properly; they become brittle and fall easily; they are often discoloured, and appear as though covered with a sticky black dust.

Though severe loss may result from damage to canes and foliage, it is the fruit which is most vulnerable. Oidium may attack the vine at any period during the growing season. It is most frequently observed just before the fruit ripens, but the gravest damage results about or

Fig. 2.—Blackened and mottled appearance of ripe vine canes caused by Oidium.

Fig. 3.—Immature berries which have split before ripening owing to hardening of the skin caused by Oidium.

shortly after blossom time. Embryo bunches attacked before the flowers open, dry up and fall off. Shortly after setting, similar damage may result, whilst later on when the berries are about half grown, the hardening of the skin preventing normal increase in size, the berries split, exposing the pips (see Figs. 1 and 3) and allowing rain to enter, thus rendering the grapes mouldy and valueless. Even if not injured to this extent, Oidium on the grapes at vintage is most undesirable. Table and drying sorts suffer much in appearance, whilst wine made from affected grapes is faulty in composition, and therefore liable to secondary fermentations. It also usually presents a characteristic "Oidium taste," being bitter and unpleasant.

Vines severely attacked ripen their wood badly, and fail to accumulate the normal reserves for next season's growth. Oidium can thus severely reduce the crop of the season following that in which the outbreak took place. It is rare, however, for vines to succumb altogether.

Life History*.

The fungus which causes Oidium and which is now known botanically as *Uncinula spiralis*, was called Oidium Tuckeri when first found near London in 1845. It was long known by this name, which was subsequently changed to Erysyphe Tuckeri, which finally gave place to its present name, when the complete or *perithecial* form was found in France in 1892.

Uncinula spiralis belongs to the great fungus group of Ascomycetes; sub-group Pyrenomycetes; order Perisporiaceæ; family Erysypheæ.

The Uncinula fungus differs radically from those causing other vine diseases, in that its mycelium† is epiphytic, *i.e.*, external to the tissues of the vine. It never enters these, but runs along the surface,

Fig. 4.—Fragment of Mycelium of *Uncinula spiralis*.

(*a*) with *haustorium* or suckers; (*h*) are *conidiophores* in various stages of development; (*b*), (*c*) and (*e*) are quite immature; (*g*) is ripe and its terminal part is breaking off in the shape of a conidium or summer spore; (*d*) and (*f*) show intermediate degrees of ripeness. After Viala.

sending suckers or *haustoria* through the outer skin to obtain its nourishment. This external nature of the mycelium is a very important feature, since it renders the disease amenable to curative treatment. Downy Mildew and Black Spot are absolutely different; their mycelia being endophytic or internal, control must necessarily be preventive. Once the fungus has obtained a footing in the tissues of the host plant it is hopelessly beyond the reach of any fungicide. The external mycelium of Oidium, on the contrary, is quite exposed, and easily reached by fungicide applications. Other well-known fungi belonging to the same orders are the powdery mildew of the rose (*Sphærotheca pannosa*); of the apple (*Bodosphæra tridactyla*), and of the cherry (*P. oxycanthæ*). Like uncinula, these are also epiphytic fungi. Though similar in outward appearance and mode of life, they are nevertheless quite distinct

* *See* Viala, Les Maladies de la Vigne, also Bioletti, Oidium or Powdery Mildew of the Vine. Bulletin No. 186i (Feb., 1907), University of California publications.

† Fungi consists of two essential parts *i.e.*, Mycelium, the growing or vegetative part and the spore bearing or reproductive portion, very variable in form. Mycelium is defined by de Bary as follows:—"Vegetative portion of thallus of fungi, composed of one or more hyphæ. The Mycelium is the feeding portion, and therefore, in the case of parasitic fungi, the harmful portion. In edible cultivated mushrooms it is popularly known as spawn."

from vine Oidium. Each needs its own particular host plant and is incapable of living on the vine.

Fig. 4 shows the different parts of the fungus in its active growing state. The roughly horizontal portion (*a*) is the mycelium, the branches growing off it (*b, c, d, e, f,* and *g*) are spore-bearing filaments or *conidiophores* in different stages of ripeness; (*h*) is a sucker or *haustorium*. (See also Fig. 1, lower part.)

The mycelium is very slender, there is but little variation in the diameter of its strands, which is barely two ten-thousandths of an inch (Omm. .0045). It is a good deal branched; from two to five strands starting from the same point. These cross one another, and seem to be knitted together at the points of contact. In bad attacks an almost felt-like network may be thus formed (see Fig. 1). The haustoria (see Fig. 4*h*) occur at intervals on the lower side; they serve the dual purpose of feeding and supporting the mycelium. They cause the minute black specks left by Oidium after its destruction (see p.).

Fig. 5.—Germinating Conidia of *Uncinula spiralis*.
Magnified 500 times. After Viala.

Unlike Plasmopara (Downy Mildew), the mycelial strands of Uncinula are septate; the septa occur at fairly long intervals, and are rather difficult to observe.

Conidiophores bearing conidia or summer spores are thrown up from the mycelium. They are very abundant on attacked berries, to which they give the characteristic white appearance. Spore production is very simple; when the conidiophore has reached its full length, septa appear in it, thus progressively detaching fragments which break off as conidia. Three or four of these are usually formed on a single conidiophore (see Fig. 4).

The conidia are about six ten-thousandths of an inch long (Omm. .016). They are extremely light, and can be carried long distances by a gentle breeze; Uncinula thus spreads with similar facility to Plasmopara (Downy Mildew). They resist dry conditions very much better than Downy Mildew spores; awaiting favorable conditions for germination. If wetted, conidia, as well as mycelium, adhere strongly, without being damaged, to the surface which supports them.

Conidia germinate by the simple emission of a germ tube (Fig. 5), which is, in fact, a mycelial strand infecting vine tissues in its

turn. It is important to remember that, unlike Plasmopara and Manginia, the conidia of Oidium do not need a drop of water for their germination—humid air suffices. It can be easily observed by placing berries attacked by Oidium under a bell glass at a temperature of 77 deg. to 86 deg. F.

Wintering Forms.

The form described above (conidial form) is that in which the fungus passes spring, summer, and early autumn—its period of active life. When it completes its life cycle it passes the winter in another form, viz., as *ascospores* contained in a *perithecium*.

Fig. 6.—Perithecium of *Uncinula spiralis*, seen from above.
Magnified 100 times. After W. G. Smith.

Fig. 7.—Diagram showing section of Fig. 6. Ascospores contained in Asci.
After W. G. Smith.

In late autumn or early winter there appear among the mycelial strands numerous round, somewhat flattened, black or dark-brown bodies; these are perithecia. They are about 1/250 of an inch in diameter, and therefore visible to the naked eye. To borrow Bioletti's ingenious illustration, they are about half the diameter of the dot of an "i" of the type in which this article is printed. They are attached to the vine surface by from ten to twenty-five hair-like appendages coiled into a spiral at the free end; hence the specific name of the fungus. They consist usually of a single thread, but are occasionally branched.

A perithecium (see Figs. 6 and 7) consists of a very resilient outer covering or rind enclosing 4 to 8—usually 6—asci. Each ascus is a sort of small sac containing in its turn, the spores to the number of 4 to 8—6 is the usual number.

These spores, or more correctly sporidia, are known as *ascospores* or *thecaspores;* by their germination the annual life cycle of the fungus is started.

In spring, under the influence of warmth and moisture, the perithecia swell and burst (see Fig. 8) (the asci burst likewise), setting free the ascospores; by their germination, which takes place in the same way as that of the ordinary summer spores, the first Oidium outbreak of the season is started. Ascospores have been found experimentally to retain their vitality and capability for germination for at least eighteen months after their formation.

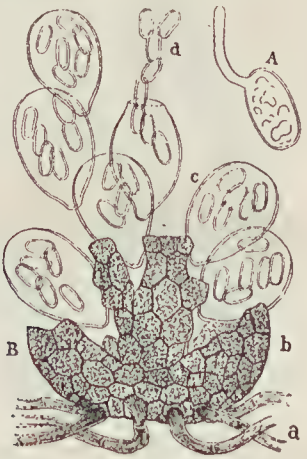

Fig. 8.—Perithecium of *Uncinula spiralis* bursting in Spring and liberating the spores; at (a) germinating ascospore.

In many cases the life cycle of *Uncinula spiralis* is incomplete, the perithecium stage being lacking. It has not been observed in Australia, nor was it known in France until 1892. Prior to that date American Oidium was generally considered to be distinct from that which occurred in European vineyards. The only difference was the absence of perithecia in the latter case; the discovery of these bodies in France dispelled all earlier doubt as to the identity of the two.

"It seems probable that the fungus, under some conditions, can pass the winter in the conidial or summer form. At all events, in certain districts the perithecia have never been found, and are, therefore, absent or very rare. They are very rare in the interior valleys of California. On the other hand, they are produced in immense numbers on vines within the influence of the summer ocean fogs. At Berkeley it is common to find thousands of them on every leaf and cane of a vine. More than 100,000 perithecia have been counted on the upper surface of a single leaf, and as each perithecium contains fifty or more spores, the number produced on a single vine may be hundreds of millions.

In Europe they are formed in September and October. In Berkeley they are found in abundance as early as the middle of June. Their formation seems to depend on weather conditions. If after a period of warm, moist weather, which has produced an abundant growth of mycelium, the temperature suddenly falls

to near the lowest limit for the growth of the fungus (50 deg. F.), they are produced rapidly and in great numbers. These are weather conditions which often occur at Berkeley and in the valleys nearest the coast.

In the interior very different conditions exist. The fungus may grow abundantly during the spring and early summer, but there is seldom any fall of temperature at this season sufficient to cause the production of winter spores. As the summer advances, the air becomes too hot and dry for the fungus, so that by the time the cooler weather of October arrives, most of the Oidium has disappeared and the abundant growth of strong mycelium which is necessary does not exist."*

In the absence of perithecia, how does the fungus over-winter? A definite answer cannot be given. Authorities are not in agreement on the subject. Professor Ravaz is of opinion that it is by means of

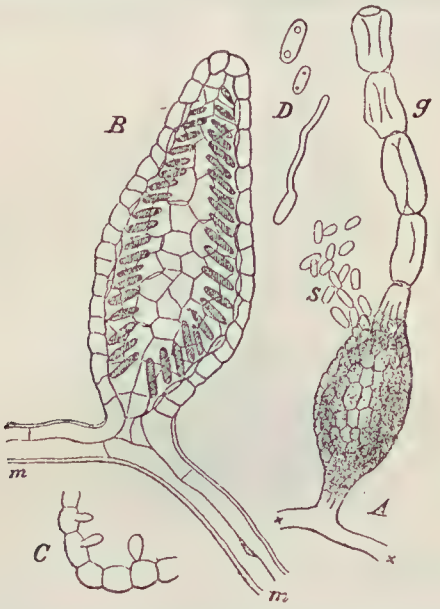

Fig. 9.—Spore-bearing bodies (pycnidia) of cicinnobolus cesatii, a fungus parasite on Oidium.

(*A*) A ripe pycnidium, formed on a conidiophore of *Uncinula spiralis* discharging its spores. (*s*), (*g*) Dead conidia of uncinula. (*B*) Immature pycnidium, showing spore formation. (*A*) Magnified 380, (*B*) 600 times.

hibernating mycelium in the dormant buds of the vine. Here it is well protected by the scales of the buds, the cottony nature of which makes them quite impenetrable by any fungicide, the use of which might be attempted.

An Oidium Parasite.

Curious spore-containing bodies have often been found on the mycelium of Oidium on badly-affected berries (see Fig. 9). These were at one time looked upon as pycnidia of the Oidium fungus. de Bary showed them to be the spore-bearing apparatus of quite a different fungus which he named *Cicinnobolus cesatii*, which lives as a parasite

* Bioletti ; *ibid.*

on Oidium. It has been suggested that artificial cultures of this organism might be used for Oidium control.* Nothing of a practical nature has been achieved in this direction.

Treatment.

Winter treatment of Oidium is quite useless. The perithecia buried in the soil are as securely protected as the oospores of Downy Mildew. Nor is the hibernating mycelium in the vine buds more accessible. Owing to their cottony nature it is not possible to reach it with fungicide solutions.

During the growing period of the vine, on the other hand, control is not only possible, but fairly easy, being greatly facilitated by the external nature of the mycelium already referred to; this even renders possible curative treatment which would be quite futile in the case of fungi with internal mycelia. Dusting with dry sulphur in powder has long been the standard treatment of Oidium. So long as the weather is warm enough for the sulphur to give off the emanations to which it owes its action excellent results can be relied on. In cooler weather sulphur is less certain and liquid sprays of various kinds can be with advantage substituted for it, chief amongst these are weak solutions of potassium permanganate and of alkaline sulphides.

Sulphur.

It is strange that this substance which is still the standard specific, should have been hit upon almost as soon as Oidium made its appearance in Europe. Dusting with dry sulphur seems to have been first proposed by Kyle, an English gardener, in 1846. Tucker seems to have recommended its application, mixed with lime, about the same time. Berkeley described the results obtained in the *Gardeners Chronicle,* in 1848.

From England the use of sulphur spread to France, where it was already in general use in the early fifties. The now familiar sulphur bellows seems to have first been invented by Gonthier, a French gardener, near Paris, in 1850.

In the earlier days of its use, sulphur did not give the uniform good results which can now be expected from it. Much had to be learnt concerning its judicious use, especially as regards the proper timing of sulphurings. One of the earliest and certainly most complete memoirs on Oidium and its treatment was that published by H. Marès, of Montpellier, France, in 1856. This remarkable work, together with later contributions by the same authority, constitute the basis of our present knowledge on sulphuring for the control of Oidium.

How Sulphur Acts.

The exact mechanism by which dry sulphur applications exercise their well-known destructive action on the Oidium fungus has given rise to much discussion. Older authorities are agreed that it is due to emanations which are produced when the sulphur is at a temperature of 77 deg. F. and over. Whether these emanations are sulphurous acid, sulphides, or merely sulphur vapour seemed uncertain. Direct contact

* Paccotet—*Viticulture,* 1st edition, p. 362.

was also held to exercise an action. According to Young, these emanations consist of pentathionic acid, an oxidation compound formed from sulphur and water.* It is evident that the emanations are more plentiful in close proximity to the particles; hence the smaller these are, so as to multiply the sources of the emanations, and the more evenly they are distributed the greater the efficiency of the treatment. Fineness also ensures better adherence to the surface of the vine. Fineness of the sulphur particles is really of far greater importance than the purity of the sulphur. The question of the fineness of the sulphur powder, and how it can be measured, will be dealt with later.

Fig. 10. A speck of the affected skin of a grape immediately after sulphuring. The black specks represent sulphur.

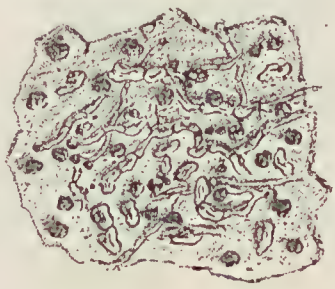

Fig. 11.—A speck of the affected skin of a grape a few days after sulphuring. The Mycelium and Conidiophores are faded and killed. The black specks represent sulphur.

Shortly after an application of sulphur, provided the weather be sufficiently warm for its action to be satisfactory, a marked change is noticeable in the appearance of the fungus (see Figs. 10 and 11), which fades, and becomes wrinkled, dying soon after.

When to Sulphur.

The right time for sulphuring, and the number of applications needed, necessarily depend on the district, and the prevalence of Oidium due to various causes. The susceptibility of the vine varieties grown, and the peculiarities of the season, must be borne in mind.

Though capable of curative treatment, as has been shown above, early treatment, before the fungus has firmly established itself on the vines, is most desirable. Prevention is always better than cure, even in the case of a disease which is capable of cure.

The fundamental rule for sulphuring laid down by Marès many years ago was to "spread the sulphur dust on all the green parts (of

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* The Toxic Property of Sulphur.—Harry Curtis Young. (*Annals Missouri Botanic Gardens.* Vol. IX, No. 4, 1922.)

Conclusions.

7. The toxic property of sulphur is not due to SO_2, SO_3, or H_2S, or any of the common acids or oxides of sulphur, or to the sulphur particle. Germ tubes grow normally in a heavy suspension of precipitated sulphur in closed ring cells.

8. The toxic property of sulphur is only exhibited when oxygen and water are present.

9. By chemical analysis the toxic property of sulphur has been found to be pentathionic acid, which is an oxidation compound formed from sulphur and water.

10. Pentathionic acid is volatile and is an active absorption compound. It is destroyed in acid and alkaline solutions.

11. Finely divided sulphur is more readily oxidized to pentathionic acid at ordinary temperatures than are the flowers of sulphur.

the vines) from the first symptoms of the disease, and renew the application each time it re-appears on the vine; further, give a sulphuring at the time of the blossoming."

Sulphuring when the vines are in flower has a decidedly beneficial effect on the setting of the fruit.

In the majority of cases a first sulphuring, when the vines are in blossom, followed by others should the fungus make its appearance, will enable the disease to be controlled.

In localities and with varieties very prone to Oidium, it is always well to give a preliminary preventive sulphuring when the young shoots of the vine are about 8 inches to a foot in length.

Under Australian conditions scalding of fruit and foliage is apt to occur should sulphuring be immediately followed by an exceedingly hot sun. It is therefore well to avoid sulphuring in such weather. Treatment under such circumstances is in any case unnecessary, the high temperature alone is capable of destroying the Oidium.

It is also well for this reason, not to follow the old-fashioned practice of only sulphuring in the very early morning "when the dew is on." It is now recognised that sulphuring at any time of the day is equally effectual, and some hours after sunrise one is better able to judge the probable maximum temperature.

In cases where scalding is feared, it is sometimes recommended to spread the sulphur on the soil, or on the crown of the vine. Applied thus it is quite efficacious, provided the day temperature rises sufficiently high, but under such conditions sulphuring should be scarcely necessary, the high temperature alone should be capable of dealing with the fungus unaided by sulphur.

(*To be continued.*)

One of the principal reasons for the low average production of cows in the Union is that they are not fed properly. By weeding out the poor and giving the good producing cows better treatment and feeding, the production would be increased.

The following are some of the important points to be borne in mind in connexion with feeding dairy cows:—

1. Feed sufficient bulk.
2. Provide some succulent feed.
3. Remember that the common farm-grown feeds are deficient in protein, so, if possible, grow some legume.
4. Feed a variety of feeds; the bodily requirements are then more likely to be met.
5. Feed according to production: if all cows are given the same ration the poor producers may be overfed and the good producers underfed.
6. Furnish the cows with a regular supply of salt, the daily requirements being 2 to 4 ounces; and regularly with plenty of clean water.

—*Journal of the South African Department of Agriculture.*

DAIRY SUPERVISION.

THE PART OF THE SUPERVISOR.

By A. J. Gill, Dairy Supervisor.

There is apparently in many districts, where the provisions of the Dairy Supervision Act do not yet apply, an altogether erroneous idea of the object of the Act and of the supervisors' duties and the manner in which the duties are carried out.

When the Department of Agriculture took over the work of supervision of dairies and dairy farms in certain districts, it was realized that it would be essential to obtain the services of practical men acquainted with the different branches of farm work, who understood the difficulties under which farmers laboured, and who had some knowledge of the scientific side of the work.

When choosing supervisors, a three-days' examination of a written, oral, and practical nature is held. The examiners, while testing the candidates' knowledge, also note their temperaments, in order that men may be selected who, in addition to possessing the necessary technical qualifications, may be relied on to deal courteously and reason quietly with farmers. On entering the departmental service a supervisor is instructed in his work before being appointed to any district.

When Government supervision was initiated, farmers were inclined to show distrust of, and in some cases, hostility to the supervisor. It took time to gain their confidence, but they soon found that the supervisor's wish was to help them in every way, and that he was often able to give them many useful hints. When they realized that he would, if occasion demanded, ride miles through any sort of weather, perhaps after a hard day's work, to give first aid to a sick cow, farmers came to look on the supervisor as a friend, and to seek his advice whenever they could.

When the introduction of impervious floors in sheds and dairies was first suggested there was naturally some complaining, but when the improvement was made, the farmer found that his daily work was relieved of some of its drudgery, and that in the altered surroundings his chances of having purer milk and cream for sale were greatly improved. The advice and assistance of the supervisor enabled many to have the required work done for very little expense and without the cost of employing skilled labour.

The suggestions made at times by supervisors for detecting diseased stock have given a sense of relief to farmers, and advice to owners of dairy herds as to feeding, testing, and culling is gradually bringing about an improvement in the yields from cows, with consequent increased cheques from the factories. Recent statistics show that cows in districts where supervision obtains are yielding well over a 100 gallons more per cow yearly than those in other districts, and this superiority is the more gratifying when we remember that the districts not under supervision form a large portion of the most favorably situated and fertile portions of the State.

The following is a striking instance of what can be achieved by one prepared to follow the progressive method recommended by Government supervisors:—

A dairy farmer who owned a herd of mongrel dairy cows returning at the rate of about £17 per head for the year, purchased a pure-bred Jersey bull from a tested herd and a few pure-bred cows. With these he commenced to build up a good herd, paying the utmost attention to testing, culling, and feeding. The yield from this herd last year averaged 420 lbs. of butter-fat per cow for nine months, which at 1s. 6d. per lb. would mean a return of £31 10s. per cow. The calves from the mongrel herd were worth from £1 to £2; those from the present herd sell at from twenty to one hundred guineas, and during the last two or three years stock to the value of £500 has been sold. The present herd is worth, approximately, £1,100, while the value of the one it replaced was not more than £180.

In supervised areas the scrub bull is slowly disappearing. One supervisor proudly claims that the number of pure-bred bulls used in dairy herds in his district has reached a total of ninety. The farmer is being brought to realize the value of pure-bred animals. Herd Testing Associations are now being formed in different districts with the object of improving the herds, and one such association in Gippsland claims that 90 per cent. of the farmers in the test are using pure-bred bulls. The supervisors throughout the State are sparing no efforts to make the association a success.

Let me cite another instance in which the result of advice given by a supervisor to a farmer in his district can be given in money terms—

This farmer had been accustomed to send his cows away every winter when his pastures gave out. This cost him £40, and it sometimes happened that he lost a couple of cows. The supervisor of the district prevailed upon him to put a portion of his farm under cultivation, with the result that, not only was £40 a year saved, but all the cattle were kept in better condition.

In another district where cattle were liable to the trouble commonly known as cripples, the supervisor recommended top-dressing the pasture and a much better growth of grass and clover followed, and all trace of disease in the herd disappeared.

The aim of the supervisors is to improve the herds of the State from year to year and make dairying work less toilsome and more profitable, and so make farming communities more contented. Towards this end they have worked quietly, but that good results have followed in their train can be easily demonstrated.

The Manager of a leading butter factory in Gippsland expressed himself in the following terms when asked for his opinion regarding Government dairy supervision:—"There is no doubt that the Act is operating in this district, has proved and is still proving of great value to the dairying industry generally. Cream from this district compares more than favourably with that received from adjoining districts, and a large percentage of our inferior cream is received from farms that are not under Government control. The Act is sympathetically administered and the supervising officer is undoubtedly a great acquisition to the dairy farmers and to the industry. Under Government control there has been a steady improvement in farm conditions which has been reflected in the quality of cream. I have pleasure in expressing my opinion on this matter, and trust that the Government will see its way clear to take steps to bring the whole State under the supervision of the Government officers."

STALLION REGISTER, 1923-24,

under the "Horse Breeding Act 1919."

Part II.—Registration prior to 22nd August, 1923.

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
978	Abbey	A	Light ..	R. M. Smith ..	Landsborough
1078	Abbotsford II. ..	5	Draught ..	D. H. Adams ..	"Belmont," Elmore
973	Abdulla King ..	A	Pony ..	E. Stevens ..	Pranjip, *viâ* Longwood
828	Aberdeen	A	Light ..	W. Haymes ..	Ballarat
827	Abutilon	3	Draught ..	Jas. Walder and Sons	Watchem
1014	Admiral Wood ..	A	Light ..	A. G. Hunter ..	Elmore
870	Agitators Heir ..	A	Draught ..	G. R. Aurisch ..	Wattle Grove, Harkaway
694	Aitken Flower ..	3	,, ..	J. Walder and Sons	Watchem
931	Aleconner ..	A	Thoroughbred	G. A. Fairbairn ..	Terangaville, Kerrisdale
1003	Alister	A	Light ..	J. Williamson ..	Alister Vale, Newry
950	All Black	3	Draught ..	J. K. Allen ..	Numurkah
1026	All Brown	3	Light ..	J. R. Laity ..	Tandarra P.O.
617	All Green	A	Thoroughbred	R. Biggar ..	Waaia
759	All Scotch	A	Draught ..	Elliott and Dickens	Corowa, N.S.W.
666	All Tricks ..	A	Light ..	Mrs. J. C. Millard	Millbank, Condah
863	Allan Stewart ..	4	Draught ..	A. J. Gordon ..	Violet Town
979	Almont, M. ..	A	Light ..	J. Minns ..	Walsingham, Melton
919	Almont Rose ..	A	,, ..	P. Dermondz ..	Dunolly
1070	Altona	A	,, ..	C. Joiner ..	Echuca
847	Amanus	A	Thoroughbred	A. and J. H. Young	Blackheath
618	Argyle	A	Pony ..	R. Trimble ..	Rutherglen
1083	Ash Voyage ..	4	Light ..	Jas. Guthrie ..	Broken River, Shepparton
899	Avon Print ..	5	Draught ..	M. Barber ..	Walla Walla, N.S.W.
704	Aztic	5	Light ..	J. R. Regner ..	Panitya East
1144	Balnakill	A	Draught ..	R. J. Thomson ..	Brim
880	Bando	A	,, ..	Sharp and Taylor	City-road, South Melbourne
997	Baritone	5	,, ..	R. Humphrey ..	Cudgewa
1060	Baron	5	,, ..	W. Maguire ..	Barwidgee Settlement, *viâ* Myrtleford
1004	Baron Alexander ..	A	,, ..	Miller Bros. ..	396 Flinders-lane, Melbourne
991	Baron Bellum ..	2	,, ..	F. C. Coy and Coy.	Salt Creek, Woorndoo

STALLION REGISTER, 1923-24—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
992	Baron Bonanza ..	2	Draught ..	F. Fairbairn ..	c/o G. and C. Fairbairn, Dalgety's buildings, Melbourne
888	Baron Brilliant ..	2	,, ..	M. P. Murphy ..	Rupanyup
1142	Baron Carlyle ..	3	,, ..	P. Bagnell ..	Mologa
1095	Baron Cicero ..	2	,, ..	A. Covin ..	Nathalia
893	Baron Clover ..	3	,, ..	Trotman & Lord	Boigbeat
1192	Baron David ..	5	,, ..	Rose Fitzgerald ..	Allansford
993	Baron Dear ..	2	,, ..	Department of Agriculture	Werribee
802	Baron Douglas ..	4	,, ..	T. Maddern ..	Blackheath
1065	Baron Edendale ..	4	,, ..	H. Watkins ..	Euroa
826	Baron Faithful ..	A	,, ..	D. Barry, junr. ..	Culgoa
1066	Baron Fashion ..	4	,, ..	J. Burns ..	Delaforce, Euroa
994	Baron Gowan ..	2	,, ..	Department of Agriculture	Werribee
794	Baron Jock	5	,, ..	Mal Lynch ..	Hopetoun
920	Baron Minto ..	A	,, ..	Executors of W. Hermiston	Mansfield
907	Baron Newton ..	2	,, ..	L. W. Crapper ..	Neilborough
657	Baron Rosebery ..	6	,, ..	Wm. Allen ..	Junortown
862	Baron Shanter ..	3	,, ..	G. McKoy ..	Holbrook, N.S.W.
780	Baron Silk ..	5	,, ..	J. H. Meyer ..	Kaniva
1017	Baron Vale ..	3	,, ..	W. J. Hocking ..	Oakvale
1196	Baron Victor ..	2	,, ..	Manifold and Coy. Ltd.	Purrumbete, Weerite
787	Baron's Favourite ..	5	,, ..	W. Bodey ..	Dooen
770	Baron's Hero ..	2	,, ..	W. H. Allan ..	Broughton
807	Baron's Pride ..	2	,, ..	T. Shanahan ..	Glenpedder, Myrniong
996	Baron's Prince ..	4	,, ..	F. Bidgood ..	Sunnyside, Staghorn
1197	Baron's Star ..	3	,, ..	G. Oman ..	Lismore
836	Beau Gallant ..	A	Light ..	T. Dunlop ..	Birregurra
887	Bell Boy	3	Pony ..	F. R. Lovell ..	Ararat P.B.
629	Bell Boy Voyage ..	6	Light ..	K. N. McKay ..	Mitiamo
819	Bell Bronze ..	3	,, ..	M. D. Leehane ..	Charlton
709	Belmont Print ..	2	Draught ..	Mrs. D. Tweeddle	Waaia
1130	Belmont's Champion	A	,, ..	H. Scarse ..	Melton
790	Ben Model ..	5	,, ..	H. Adams ..	Yaapeet
620	Berra Bach ..	A	Pony ..	Timmins and Watson	Marnoo
1074	Bill Orange ..	3	Thoroughbred	W. J. Everett ..	Tongala
1114	Billy Baker ..	6	Light ..	J. L. Vallance ..	Cohuna
1052	Bingen	5	Draught ..	Watts Bros. ..	Kamarooka
835	Birdwood	A	Light ..	W. Morris ..	32 Ascot Vale-road, Newmarket
1135	Bismarck	A	,, ..	H. J. Manthorpe	Inglewood
876	Blackboy	A	,, ..	F. Stares ..	Longford
849	Black Rock ..	A	Pony ..	A. Shanks ..	Tooloy Bag, Lake Mundi

STALLION REGISTER, 1923–24—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1075	Black Shepherd ..	5	Draught ..	G. Simpson ..	Yambrina, Tongala
1057	Black Steel ..	A	Thoroughbred	J. Cantwell ..	Walpeup
928	Black Voyage ..	4	Light ..	J. Perino ..	Marong
1174	Blair's Choice ..	5	Draught ..	W. M. R. Keam ..	Glenlea, *viâ* Gerang
841	Blue Ribbon ..	A	,, ..	D. McGrath ..	Manangatang
1116	Blue Trout ..	A	Thoroughbred	H. J. Robb ..	Thornton
1137	Blue Wilks ..	A	Light ..	H. Goujan ..	505 Howard-street, Ballarat
1136	Bob Ash	A	,, ..	Thos. Moore ..	Kialla East
964	Bobbie	5	Pony ..	I. E. Barratt ..	Traynor's Lagoon
874	Bogandyera ..	A	Thoroughbred	J. Hargreaves ..	Dederang
684	Bold Arthur ..	4	Draught ..	Jas. Galloway ..	Majorca
1099	Bold Baron ..	A	,, ..	R. L. Pearse ..	Kewell South
834	Bold Briton ..	A	,, ..	C. A. Schulz ..	Lake Hindmarsh, *viâ* Jeparit
773	Bold Captain ..	4	,, ..	T. Parker ..	Pepper Plains
749	Bold Dundonald ..	4	,, ..	C. Murphy ..	Wangaratta
747	Bold Jock ..	A	,, ..	J. Bayliss ..	Eaglehawk
1008	Bold Lad	A	Pony ..	G. Plant ..	Nancella
968	Bold McGregor ..	4	Draught ..	J. R. Duff ..	Narracoorte
1042	Bold Newton ..	A	,, ..	J. R. Mitchell ..	Sandford
933	Bold Wyllie ..	5	,, ..	Department of Agriculture	Brisbane, Queensland
665	Bolwalla	A	Thoroughbred	Harris and Dunne	Warrnambool
1191	Bonnie	3	Pony ..	F. H. Osborne ..	Cudgee
1030	Bonnie Abbott ..	4	Draught ..	W. G. Wilkinson	Yarrawonga
817	Bonnie Belmont ..	A	,, ..	J. T. Watkins ..	Euroa
1188	Bonnie Brag ..	A	,, ..	King Bros. ..	Kinrabulla P.O.
903	Bonnie Dundee ..	2	,, ..	Jas. Spedding ..	Woodstock West
957	Bonnie Everest ..	3	,, ..	Lansdowne Pastoral Coy. Ltd.	Queensland
951	Bonnie Salisbury ..	3	,, ..	C. H. Feldtman ..	Major Plains, *viâ* Gooromba bat
961	Bonnie Viceroy ..	2	,, ..	J. Bunge and Sons	Sheep Hills
660	Bonnie Voyage ..	A	Light ..	P. B. Glashem ..	Huntly P.O.
958	Boquhan Kennedy ..	A	Draught ..	W. Graham ..	Naring East *viâ* Numurkah
729	Bramhope Forester	A	,, ..	Mrs. A. E. Rodgers	Jacka Jacka, Tooan
761	Bramhope Kelm ..	3	,, ..	G. Hicks ..	Miram
1018	Breadwinner ..	A	Light ..	E. Prime ..	127 Lily-street, Bendigo
1112	Brecknock ..	A	Pony ..	R. Hentschel ..	Bonnie Doon
727	Breedon Pioneer ..	A	Draught ..	M. C. Ryan ..	Chetwynd
686	Brigham	3	Pony ..	J. E. Edwards ..	Tottington, St. Arnaud
1055	Brigham Shanter ..	A	,, ..	J. J. Wall ..	Numurkah
609	Brighams Last ..	A	,, ..	P. E. Baulch ..	Orford, *viâ* Port Fairy

STALLION REGISTER, 1923–24—*continued.*

Cert No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
980	British Admiral ..	A	Draught ..	W. Sheehan ..	South Muckleford
653	Briton's Pride ..	A	Pony ..	G. Kenworthy ..	211 Scott's-parade, Ballarat East
937	Bronte	5	Thoroughbred	A. Gillis ..	Newmarket
952	Brown Brilliant ..	3	Draught ..	J. T. Bartlett ..	Barnawartha
641	Brydon	A	,, ..	L. G. Parker ..	Darriman
872	Bundoora Black Leigh	6	Light ..	Miss B. B. Reid..	Blossom Park, Bundoora
654	Bushlark	A	,, ..	W. H. Penaluma	Boolarra
830	Caledonia	A	Draught ..	Withers Bros. ..	Bobinawarrah
873	Calland Dale ..	A	,, ..	J. E. Hooper ..	Devenish
806	Canary II. ..	5	Pony ..	G. T. Barber ..	Korweingu-boora
621	Canberra	A	Draught ..	C. Bowland ..	Gunbower
630	Capitalist	A	,, ..	A. K. Urquhart..	Goonerah, Hexham
1054	Captain White ..	A	Thoroughbred	Robt. Gilder, junr.	Sale
652	Carden	A	Light ..	W. H. Penaluna	Boolarra
740	Carman	A	,, ..	W. Lane ..	Lucknow
705	Carmyle	2	Draught ..	A. McKinnon ..	Walpeup
987	Carolyn	A	,, ..	J. R. Peachey ..	Darlingford
706	Cedric Dale ..	4	,, ..	P. O. H. Thomas	Walpeup
917	Celmar Style ..	6	Light ..	W. Cochrane and Sons	Doveton-street, Ballarat
1032	Centrewood ..	A	Draught ..	C. E. Young ..	Main - street, Mornington
832	Champion of Kelmscott	A	,, ..	W. H. Robinson	Kerang P.B.
681	Cherry Farm Standard	5	,, ..	Dyke Bros. ..	Gre Gre Village
861	Cherry Vale ..	A	Thoroughbred	Jas. Wright ..	Beech Forest
1069	Cheviot	A	Light ..	M. Zimmer ..	Epping
1168	Clairs Pride ..	3	Draught ..	J. H. May ..	Joel Joel
728	Claredon	A	Pony ..	Bennett Bros. ..	Coleraine
622	Clarendon II. ..	A	,, ..	C. Underwood ..	Timboon
643	Clarion	A	,, ..	W. H. Thompson	Yalca
805	Claymore Junior ..	3	,, ..	J. P. Hanrahan ..	Ballan
758	Cock Robin ..	A	Draught ..	T. G. Warren ..	Orbost
981	Coliban	A	,, ..	Wm. Todd ..	Taradale
1056	Colonel Garfield ..	A	,, ..	Millard Bros. ..	Dean's Marsh P.O.
714	Commonwealth ..	A	Light ..	S. Mathieson ..	St. Helens Plains
682	Conqueror.. ..	4	Draught ..	D. and M. McKinnon	Beazley's Bridge
974	Cosmopolitan 2nd ..	A	Light ..	Wade Bros. ..	Glenalvie P.O.
786	Count Bingen ..	5	,, ..	M. G. Porker ..	Green Park, Horsham
1093	Couper's Best ..	4	Draught ..	Baxter Bros. ..	North Mooroopna
959	Craig Derby ..	3	,, ..	A. R. Allan ..	Broughton, *viâ* Nhill
769	Craigieburn's Pride..	2	,, ..	W. H. Allen ..	Yanac
936	Craigielea of Aberdour	3	,, ..	Wilkinson and Young	Yarrawonga
1034	Crown Steel ..	A	Thoroughbred	J. Sharp ..	Minyip

STALLION REGISTER, 1923-24—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
789	Culcoon	3	Light ..	Mrs. M. Spargo ..	Nypo, *viâ* Yaapeet
1005	Cyanide	A	Pony ..	W. G. Reddick ..	Woorarra
751	Dalbora's Pride ..	2	Draught ..	Mrs. E. T. White	Mittyack
1094	Dalcrombie ..	2	,, ..	A. Colvin ..	Nathalia
1175	Dalmore Again ..	3	,, ..	J. A. Todd ..	Willenabrina North
793	Dalmore Pride ..	4	,, ..	W. T. McAlpine senr.	Hopetoun
764	Dalmore's Choice ..	2	,, ..	J. Bunge and Sons	Sheep Hills
765	Dalmore's Keynote	2	,, ..	J. Bunge and Sons	Sheep Hills
813	Dalmore's King ..	3	,, ..	J. G. Bunworth ..	Donald
698	Dalmore's Pride ..	5	,, ..	R. G. Heynam ..	Patchewallock
1006	Dan Patch Junior ..	A	Light ..	Jas. McCormick ..	Gateside, Knowsley P.O.
785	Dandenong ..	5	Pony ..	R. C. Ladlow ..	Dooen North
725	Dandy	A	,, ..	Campbell, R. ..	c/o. Cordite Factory, Maribyrnong
662	Dandy Again ..	A	,, ..	R. Lawler ..	Ouyen
904	Dandy Direct ..	5	Light ..	Wilkinson and Graves	Manangatang
667	Dandy Duke ..	A	Pony ..	Kong Meng Bros.	Longwood
871	Dandy Junior ..	A	,, ..	Robt. Withers ..	Bobinawarrah
1153	Dandy Lad ..	A	,, ..	Stuckey Bros. ..	Flynn's Creek
940	Dandy Lad ..	A	,, ..	A. C. Head ..	Seymour
1021	Deck Top ..	A	Light ..	Mackin Bros. ..	Korong Vale
1081	Dinkum Direct ..	2	,, ..	R. McLarty ..	Mitchellstown, *viâ* Nagambie
1068	Direct Kola ..	4	,, ..	J. A. Wilson ..	Pira, *viâ* Swan Hill
1063	Director	4	,, ..	J. Jeffrey ..	Echuca
649	Dixie Boodle ..	A	,, ..	P. V. Fraunfelder	Wodonga
1161	Dixie Jim ..	2	,, ..	J. G. Gardner ..	Rogers-street, Wangaratta
738	Domination ..	A	Pony ..	C. T. Lucas ..	Pomberneit
922	Don Huon ..	A	,, ..	W. Lyons ..	Drouin P.O.
913	Don Marvin ..	A	Light ..	J. Rousch ..	236 Nicholson-street, Footscray
865	Don Olive ..	A	Pony ..	A. Cheesley ..	Barnawartha
976	Don Tourie ..	A	Light ..	J. Dillon ..	Manangatang
707	Donald Dale ..	4	Draught ..	J. Frith ..	Torrita
879	Donibristle ..	A	,, ..	Trustees of Wilson Estate	Home Station, Milawa
1127	Donvin Chimes ..	3	Light ..	J. D. Mulfahey ..	6 Service-street, Albert Park
1100	Douglas Chief ..	A	Draught ..	W. G. Sallman ..	Dimboola
955	Douglas Knight ..	3	,, ..	Australian Estates and Mortgage Co. Ltd.	114 William-street, Melbourne
801	Douglas Prince ..	3	,, ..	E. W. Harders ..	Box 61, Dimboola
1051	Drummond King ..	A	,, ..	W. Watts ..	Wamaropka
900	Drumry Equipment	6	,, ..	J. Maher ..	Tatura
1186	Dugald Dalgetty ..	3	,, ..	H. Davies ..	Curlewis
744	Duke Little Eyes ..	A	,, ..	A. E. Bowman ..	Fairy Knowe, Tallangatta

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1025	Duke of Winton ..	4	Light ..	W. C. Bain ..	Lake View, North Winton
1126	Dunaskin ..	2	Draught ..	J. H. Pickin ..	Coleraine
1102	Duncan Stewart ..	6	,, ..	J. Fitzpatrick ..	Heyfield
669	Dundonald's Chief ..	A	,, ..	H. Doherty ..	St. James (Vic.)
1041	Earl of Claymore ..	2	,, ..	J. Hiskins ..	Rutherglen
1146	Eaton Headlight ..	5	,, ..	E. W. Schneider ..	Yulecart
1147	Eaton's Pride ..	3	,, ..	G. Grey ..	Branxholme
708	Eclypse	2	,, ..	A. McKinnon ..	Walpeup
1182	Electioneer ..	A	Light ..	G. J. Shaw ..	Yarram
748	Emerson ..	5	Thoroughbred	A. S. Blair ..	Box 30 Watchem
1167	Ercildoune Dick ..	A	Pony ..	D. Gardner ..	Ercildoon, Milawa
814	Estelle Junior ..	4	Light ..	D. Green, junior	Mullawil
923	Ettrick	A	Draught ..	A. Gordon ..	Violet Town
946	Fabric Again ..	3	,, ..	Colvin, A. ..	Nathalia
850	Fabric's Heir ..	6	,, ..	Department of Agriculture	Brisbane, Queensland
972	Fabrikoff's Heir ..	3	,, ..	W. Cheesley ..	Barnawartha
1171	Factotum ..	4	,, ..	G. Buckley ..	Wickliffe
1020	Falmouth ..	A	Thoroughbred	W. R. Cullen ..	Wahgunyah
623	Fashions Model ..	A	Draught ..	A. B. Hamilton	Riccarton, Fish Creek
1165	Federal Duke ..	A	,, ..	J. Hendry ..	Bridgewood
1040	Federal Sail ..	5	,, ..	J. D. Rhodes ..	Daysdale, N.S.W.
818	Fidelio	A	Thoroughbred	T. H. Smith ..	Lalbert
984	Firebrick	A	Light ..	P. Higgins ..	Cowwar
954	First Admiral ..	6	Draught ..	A. Stewart ..	Donald
658	First Voyage ..	A	Light ..	P. H. Busst and P. B. Glacheen	Huntly P.O.
1172	Fitzallans Model ..	3	Draught ..	A. E. Male ..	Glenthompson
891	Flash Dale ..	3	,, ..	T. Bagnell ..	Yarrawalla
717	Flash Donald ..	A	Light ..	W. J. Collins ..	Woomelang
1085	Flying Possum ..	6	Pony ..	H. E. Woods and Sons	Mooroopna
966	Foamy Voyage ..	5	Light ..	A. V. Mahar ..	Kerang
867	Footwork	5	,, ..	J. Chapman ..	Ouyen
1176	Forrest King ..	3	Draught ..	G. Meek ..	Kimma Kat Ka
999	Free Scot	A	Light ..	T. Robertson ..	Moyne Falls, Macarthur
977	Fulham Bells ..	4	,, ..	J. B. Gannon ..	34 Williamstown-road, Port Melbourne
631	Gallant Lad ..	A	Draught ..	H. Gould ..	Yaapeet
1000	Garfield Junior ..	A	Pony ..	F. B. Turner ..	Glenthompson
642	Garnet	A	Light ..	J. J. Carmody ..	Leongatha
1043	Gay Gordon ..	A	Pony ..	J. R. Mitchell ..	Sandford
724	Gay Voyage ..	A	Light ..	P. A. Beaumont ..	Ouyen
995	General Jess ..	2	Draught ..	D. L. Bodey ..	Jung
820	General Ribbonwood	A	Light ..	A. Simpson ..	South-road, Moorabbin
930	General Wallace ..	5	Draught ..	J. T. Bartlett ..	Barnawartha
1092	George Wilks ..	4	Light ..	H. D. Adams ..	Kotupna
624	Gillies Son ..	A	Draught ..	Boyd Bros. ..	Yarrone, Koroit
775	Glen Arthur ..	5	,, ..	A. Arnold ..	Warracknabeal

STALLION REGISTER, 1923-24—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
691	Glen Direct ..	4	Light ..	P. Whitechurch ..	Box 168, Mildura
932	Glenalla	4	Draught ..	Department of Agriculture	Brisbane, Queensland
896	Glendale	5	,, ..	McEnroe ..	Western Australia
864	Glendale	6	,, ..	R. C. Gulliver ..	Balldale, N.S.W.
970	Glenmore	5	,, ..	A. Colvin ..	Nathalia
613	Glenscott ..	A	,, ..	P. McNeil ..	Box 75, Sea Lake
723	Glyn Trustful ..	A	Pony ..	Roth Bros. ..	Ensay
975	Gobbler	6	Draught ..	A. Knight ..	Lake Bolac
1046	Gold Dust	A	Light ..	Mrs. M. Birss ..	Stradbroke
852	Gold Mauritius ..	5	,, ..	C. Potts ..	Crosbie - road, Murrumbeena
1009	Golden Action ..	A	,, ..	H. W. Newson ..	Garden - street, Essendon
1156	Golden Hue ..	A	,, ..	A. W. Cardinal ..	Nalangil P.O.
1019	Goldie	A	,, ..	W. J. Minns ..	Melton South
1113	Governor Wilks ..	3	,, ..	J. Collins ..	Nathalia P.O.
886	Grampian Lad ..	4	Draught ..	A. Richards ..	Gymbowen
1016	Grand March ..	A	,, ..	W. M. Hughes ..	Belmont Hill, Inglewood
659	Grattons Voyage ..	A	Light ..	Busst and Glasheen	Huntly P.O.
1013	Hamilton Emulator Junior	A	Pony ..	Todd Bros. ..	Willenabrina North
1103	Hamilton Hero ..	A	Draught ..	A. Booley ..	Banyan, *viâ* Woomelang
971	Hampton Ben ..	A	,, ..	P. Zealander ..	Warracknabeal
1199	Harlequin ..	A	Pony ..	L. Morcombe ..	Snake Valley
935	Harold A. ..	A	Light ..	H. J. Blackie ..	Ararat
745	Harold Direct ..	6	,, ..	J. Glenn ..	Tylden
721	Here's Luck ..	A	Pony ..	C. J. Anderson ..	Tarranyurk
625	Herward Junior ..	A	Light ..	J. A. Haebich ..	Bittern
851	High Commander ..	A	Draught ..	Griffiths Bros. ..	Gretaw
837	High Degree ..	A	,, ..	Schroeder Bros. ..	Murrayville
644	Highland Boy ..	A	,, ..	S. E. Moss ..	Quambatook
939	Highland Fancy ..	A	,, ..	Hildebrand, G. ..	Leitchville
1049	His Majesty ..	A	,, ..	M. Frawley ..	Leigh Creek
1117	Honest Cleve ..	A	Light ..	Wm. Eichler ..	Chillingollah
877	Honest Wilks ..	A	,, ..	H. D. Adams ..	Kotupna
846	Honey King ..	A	,, ..	O'Loughlin Bros.	Leongatha
737	Hotspur	A	Pony ..	Z. L. Small ..	French Island
1148	Hullabaloo ..	A	Light ..	G. Bennett ..	Chinkapook
1173	Humoresque ..	5	Pony, Shetland	A. C. Bayley ..	Willaura
815	Huon's Joy ..	5	Pony ..	C. S. Wade ..	Bronzewing
664	Ian McClelland ..	A	Draught ..	H. Naylor ..	Roseberry East
1139	Idris	2	Light ..	S. Winter-Cook ..	Murndal, Hamilton
663	Imperial Crown ..	A	,, ..	T. G. Maher ..	Bush Inn Hotel, Purnim
626	Interest	A	Pony ..	A. Kennedy ..	Arcadia
1091	Inverness	2	Draught ..	A. Colvin ..	Nathalia
695	Inverness Bute ..	2	,, ..	J. Walder and Sons	Watchem
905	Jack Gratton ..	3	Light ..	J. Evans ..	Morrl Morrl, *viâ* Stawell

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
719	Jack Huon ..	A	Light ..	F. G. Ronalds ..	Warrenheip-street, Bun-inyong
768	Jack Tar	4	Draught ..	J. J. C. Dufty ..	Lorquon West
1050	Jet	A	Pony ..	D. H. McConnell	Longford
1028	Jimmy Direct ..	5	Light ..	J. Isaac ..	Inglewood
757	Jock	A	Draught ..	G. T. Wolsten-holme	Milawa
1160	Jock Cedric ..	4	,, ..	J. W. Gardner ..	Cavendish
687	Jock MacGregor ..	2	,, ..	Reseigh and Flockart	Culgoa
1184	John Brigham Last	A	Pony ..	J. Toogood ..	Hawkesdale
1163	Judge Byron ..	A	Light ..	A. S. McColl ..	Seaspray, Sale
1155	Julius of Bolobek ..	4	Draught ..	E. Allan ..	Ondit
938	Justice	5	,, ..	Sir R. Clarke ..	Lancefield Junction
627	Kelly	6	Pony ..	S. Pianta ..	Murtoa
683	Kelvin	3	Draught ..	D. and M. McKin-non	Beazley's Bridge
1007	Kemp Daly ..	A	Light ..	G. H. Minns ..	Melton
965	Killawney ..	4	Draught ..	J. E. Oram ..	Marnoo
1010	Kilmore	A	,, ..	J. Russell junior..	Orbost
628	King Albert ..	A	,, ..	T. McKay ..	Malmsbury
882	King Bally ..	A	Light ..	F. Lee ..	Clunes
716	King Bee	A	Pony ..	W. T. McAlpine..	Hopetoun
772	King Jack ..	2	Draught ..	A. A. Zanker ..	Jeparit
908	King John ..	4	,, ..	A. Cail.. ..	Kamarooka
1119	King of the Valley ..	A	,, ..	Jas. Murdoch	Lake Bolac
1109	King Osterley ..	A	Light ..	J. M. Fahey ..	Gnotuk
842	King Stanley ..	A	Draught ..	E. Land ..	Oxley
859	King Treasure ..	2	,, ..	J. G. Bail ..	Kyabram
1089	King Victor ..	4	,, ..	A. Dunning ..	Numurkah
1157	King Wilkes ..	A	Light ..	J. Brights ..	Stony Creek
792	King's Own ..	4	Draught ..	E. Johns ..	Gama
645	King's Own ..	A	,, ..	J. Denham ..	Leongatha
655	King's Treasure ..	A	Thoroughbred	G. Ritchie ..	Mansfield
949	Kitcheners Pride ..	4	Draught ..	H. C. Younger ..	Wattle Hill, Greta
696	Lancashire Chief ..	3	,, ..	R. Bunworth ..	Woomelang
811	Langdale	4	,, ..	M. Donnellan ..	Jeffcott North
929	Larrakin	5	Light ..	F. A. Rigby ..	Box 7, Walpeup
741	Leeway	A	,, ..	W. G. Robertson	Hesse, *via* Wingul
866	Leo's Pride ..	A	Pony ..	Miss Small ..	Nyora - road, Glen Iris
916	Lilburne Regent ..	A	Draught ..	J. Hargreaves ..	Dederang
752	Little Black Pony ..	A	Pony ..	Jessie M. Armstrong	Branxholme
632	Little Pos ..	A	Thoroughbred	A. K. Urquhart	Boonerah, Hexham
679	Lonsdale Again ..	3	Draught ..	T. Zimmerman ..	North Devin
918	Lord Bindi ..	A	,, ..	R. T. E. Yapp ..	Tambo Upper
1133	Lord Lascelles ..	4	,, ..	Sharp and Taylor	Glenarona, High Camp
848	Lord Lyndem ..	A	,, ..	Jas. Vickers ..	Colbinabbin West
1110	Lord Percival ..	A	,, ..	J. M. Fahey ..	Gnotuk
726	Lord Pilatus ..	A	Thoroughbred	J. R. McBean ..	Goroke

STALLION REGISTER, 1923–24—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
921	Lord Threve ..	6	Draught ..	W. J. Schmidt ..	Jeparit
889	Lord Wallace ..	4	,, ..	W. Belleville ..	Galah
678	Lothian Again ..	2	,, ..	Dyke Bros. ..	Gre Gre Village
808	Lucky Boy ..	2	,, ..	Graham Bros. ..	Bacchus Marsh
884	McAgain	5	,, ..	T. R. Buffham ..	Horsham
784	McKinney Star ..	6	Light ..	Noel Bros. ..	Terang
800	Mac's Fancy II. ..	4	Draught ..	A. C. Jorgensen	Katyil
1038	Magic Railway ..	4	Pony ..	Jessie Wilkin ..	278 Toorak-road, South Yarra
677	Magnet	3	Draught ..	K. Cameron ..	c/o. Young Bros., Warracknabeal
924	Mahomet	A	Pony ..	A. Brown ..	Rupanyup
1151	Major Again ..	6	Draught ..	H. M. Bywater ..	Babrootam North
702	Major Clyde ..	5	,, ..	J. J. Gleeson ..	Corack East
783	Major Gratton ..	3	Light ..	R. N. Keating ..	Antwerp
1045	Major Jock ..	A	Draught ..	F. C. Glanville ..	Echuca North
989	Major Mark ..	4	,, ..	C. H. Feldtman ..	Major Plains, Dookie
1064	Major Style ..	4	,, ..	P. Daldy ..	Arcadia South
1107	Major Style ..	A	,, ..	R. Gutheridge ..	Silvan
646	Major Thornley ..	A	,, ..	T. Torpey ..	Turriff
699	Malleepecker ..	4	Thoroughbred	A. T. Finch ..	Speed
736	Mambrimo Wilkes ..	A	Light ..	J. Brown ..	c/o. Mrs. Cowell, Baillie - street, Horsham
701	March Along ..	3	Draught ..	H. Carr ..	Manangatang
869	Marmaduke ..	A	Pony ..	A. J. Gillies ..	Noorat
969	Marquis Bold ..	3	Draught ..	W. Turnbull ..	Wedderburn
760	Master Dix ..	A	Thoroughbred	P. T. Larsen ..	Eskdale
650	Melrose Bounty ..	A	Light ..	Melrose Dairy Pty. Ltd.	c/o. Glenferrie and Malvern roads, Malvern
647	Menkawrah ..	A	Thoroughbred	J. L. Vallence ..	Cohuna
914	Merry Chimes ..	3	Light ..	F. W. Rangott ..	Chillingollah
718	Merry King ..	A	Pony ..	W. F. Maroney ..	Wangaratta
857	Merven Chief ..	3	Draught ..	J. G. Bail ..	Kyabram
1012	Metal Bells ..	5	Light ..	H. Colvin ..	Nathalia
1104	Mickey	A	Pony ..	R. Booley ..	Banyan, *viâ* Woomelandg
766	Middlerigg Referee ..	4	Draught ..	C. Lindner ..	Murtoa
947	Middlerigg What's Wanted	A	,, ..	E. McKoy ..	Wodonga
1001	Miniature 3rd ..	A	Pony ..	T. Robertson ..	Moyne Falls, Macarthur
671	Minstrel	A	,, ..	D. Begley ..	Colac
915	Models Herod ..	5	Draught ..	M. Hutcheson ..	Pine Grove *viâ* Mitiamo
1059	Monach	3	Thoroughbred	J. Bell ..	Mudgegonga, Myrtleford
673	More Huon ..	A	Light ..	H. E. Fisk ..	Leongatha
1121	Moredun Ranger ..	3	Draught ..	J. R. Mitchell ..	Sandford
776	Morocco Chief ..	2	,, ..	A. Arnold ..	Warracknabeal

STALLION REGISTER, 1923-24—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
788	Moving On ..	4	Light ..	H. Fisher ..	Yaapeet
988	Moving Picture ...	A	,, ..	W. Fisher ..	Yaapeet
963	My Chimes ...	3	,, ..	J. M. Cromie ..	Swan Hill
1084	Napar	A	,, ..	E. Land ..	Oxley
774	Newfield's Pride ..	5	Draught ..	J. M. Martin ..	Aubrey-road
831	Newton Lad ..	A	,, ..	T. N. Skinner ..	Bordertown, South Australia
692	Niggering	4	Light ..	E. G. Traeger ..	Merbein South
1145	Noble Glen ..	3	Draught ..	W. Nagorcka ..	Tarrington
1031	Non Pareil ..	5	,, ..	W. Geddes ..	Boomahnoomoonah
804	Norman's Pride ..	3	Pony ..	A. Harrington ..	Leigh Creek
1073	Novel Print ..	4	Light ..	P. Maher ..	Tatura
1098	Nyallo Prince ..	6	,, ..	W. T. McAlpine, junior	Hopetoun
1015	Onward Star ..	A	Draught ..	J. W. Murchison ..	Dumbalbalane
1154	Onward's Pride ..	2	,, ..	J. Hannebery ..	Miepoll
661	Orion	A	Thoroughbred	W. D. Cross ..	Tangambalanga
934	Our Bobby ..	A	Pony ..	R. P. Gardiner ..	Lurg, *viâ* Benalla
1086	Owyhee Chief ..	A	Light ..	J. Shanahan ..	4 Corsair-street, Richmond
1105	Palos	A	,, ..	R. Warren ..	West Moolap P.O.
1118	Patrician	2	Draught ..	R. and A. McClelland	Lara
633	Patrick's Pride ..	A	,, ..	E. L. Edwards ..	Avenue-road, Bacchus Marsh
838	Patriotic	A	,, ..	H. L. Ferry ..	Buangor
967	Periscope	A	Light ..	J. and M. Ervin ..	Pyramid
735	Peter	A	,, ..	J. Carroll ..	Mudgegonga
854	Pettadale	5	Draught ..	N. Ramsay ..	Newbridge
1077	Pettadale II. ..	3	,, ..	T. Lees ..	Rochester
855	Phylactery ..	A	Thoroughbred	A. B. Gibbons ..	Cohuna
825	Ploughboy ..	A	Draught ..	P. Donovan ..	Learmonth
675	Plucky Willie ..	3	,, ..	R. Wetherington	c/o. Young Bros., Horsham
634	Plumlea	A	Light ..	P. Fischer ..	Weiderman's L.B., *viâ* Jeparit
856	Politician	A	,, ..	W. J. Wood ..	Moyhu
637	Premier Lauder ..	6	Draught ..	G. S. Wall ..	Gowangardie South
799	Premier Success ..	3	,, ..	P. H. Müller ..	Dimboola
1158	Premier Thomas ..	A	,, ..	A. McDonald ..	Chillingollah East P.O.
635	Preston	A	Pony ..	E. McEvoy ..	Colbinabbin
1141	Pride	A	,, ..	F. Mitchell ..	Walwa
839	Prince Alexander ..	A	Draught ..	Trask Bros. ..	Warncoort P.O.
1106	Prince Charles ..	A	Pony ..	J. Dawkins ..	Colac
782	Prince Dale	2	Draught ..	J. Downey and Son	Wallace
1033	Prince Edward ..	A	,, ..	D. King and Sons	Rutherglen

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
875	Prince Ettrick ..	A	Draught ..	A. R. Paynter ..	Violet Town
1048	Prince Harold ..	A	Pony ..	H. Robertson ..	Wallacedale
1200	Prince of Lorne ..	A	Draught ..	E. H. P. Young ..	Congupna-road
1187	Prince Wigton ..	3	,, ..	K. McKenzie ..	Werribee
858	Rainy Voyage ..	2	Light ..	J. G. Bail ..	Kyabram
1169	Real Scotch ..	6	Draught ..	J. Rumbold ..	Laanecorrie
1149	Red King ..	A	Light ..	Wm. Holland ..	Benambra
670	Regis	A	Draught ..	E. Manifold ..	Camperdown
781	Reisorel	5	Light ..	W. G. Parish ..	Horsham
697	Review	4	Draught ..	J. Donnan ..	Watchupga
1023	Richard Cleve ..	A	Light ..	R. Parker ..	Kongwak
1150	Rifle Boy	A	Pony ..	P. R. Cooke ..	Euroa
885	Rising Star ..	5	Draught ..	Timmins and Watson	Marnoo
1129	Roala	4	Pony ..	B. E. Lyon ..	Coleraine
755	Robert Alto ..	A	Light ..	A. Kennedy ..	Arcadia
1096	Robert Bruce ..	5	Draught ..	H. Gregerson ..	Benalla
1122	Roger Bold ..	3	,, ..	R. T. Mitchell ..	Sandford
824	Ronyas Bells ..	A	Pony ..	M. M. Saynor ..	46 Elgin-street, Hawthorn
941	Roseberry ..	A	Light ..	E. McKoy ..	Wodonga
798	Rosedale	2	Draught ..	P. H. Müller ..	Dimboola, Box 88
651	Rothmont	A	Light ..	J. A. Kirkpatrick	Lismore
823	Roy	A	Pony ..	J. B. Cleeland ..	Newhaven, Ph. Is.
762	Royal Bill	5	Draught ..	W. J. Collins ..	Beulah
1159	Royal Bob ..	A	,, ..	D. Treweek ..	Red Cliffs
910	Royal Charm ..	4	,, ..	T. H. Smith ..	Lalbert
796	Royal Chief ..	4	,, ..	W. G. Burns ..	Goroke
1076	Royal Craig ..	5	,, ..	D. Trewick ..	Elmore
753	Royal Crown ..	A	,, ..	J. A. Goodwin ..	Wunghnu
925	Royal Douglas ..	A	,, ..	T. Thornton ..	Waaia
1120	Royal Escort ..	A	,, ..	Hooper Bros. ..	Devenish
688	Royal Fashion ..	5	,, ..	A. J. D. McRae	Gre Gre North
648	Royal Gartley ..	A	,, ..	C. P. Butler ..	Warracknabeal
853	Royal Hero ..	5	,, ..	R. J. Keating ..	Hillside
713	Royal McGregor ..	5	,, ..	Vallence Bros. ..	Nullawil
1090	Royal Main ..	4	,, ..	A. J. Trevaskis	Murchison
840	Royal Robin ..	A	,, ..	T. W. Bridgett	Charlton
1181	Royal Rufus ..	6	Light ..	L. Morrison ..	Fredrick-street, Yarraville
1088	Royal Scotty ..	4	Draught ..	S. Fawcett ..	Numurkah
795	Royal Simon ..	3	,, ..	J. Patching ..	Gymbowen
668	Royal Style ..	A	,, ..	McQueen Bros. ..	Waubra
1035	Royal Style ..	4	Light ..	J. Isaac ..	Inglewood
636	Rufus	A	Thoroughbred	W. Jubb ..	Hexham
878	Rufus	3	Draught ..	Mrs. S. E. Kent	Sheep Hills
909	St. George ..	2	,, ..	C. H. Jackman ..	Tandarra
1071	Safe Voyage ..	5	Light ..	D. Murchison ..	Katamatite
1177	Sandy's Fashion ..	4	Draught ..	E. Haines ..	Gerung
1190	Santa Claus ..	3	Pony ..	W. Henderson ..	Grasmere
756	Santrel	A	Light ..	R. W. Storey ..	Murchison East
983	Sarsfield	A	Pony ..	C. W. Heaney ..	Kilmore
1072	Scotch Lynn ..	2	Draught ..	P. Hartigan ..	Byrneside
1193	Scotch Willie ..	2	,, ..	McKenzie Bros.	Wallup

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1036	Scotland Again ..	2	Draught ..	T. J. Witherow ..	Wangaratta South
1166	Scotland's Peer ..	A	,, ..	D. Gardner ..	Milawa
894	Scotland's Signet ..	A	,, ..	W. Ramsay ..	Newbridge
797	Scotland's Viceroy's First	4	,, ..	P. B. Miller ..	Katyil
777	Scotland's Victory ..	3	,, ..	J. S. Gray ..	Sheep Hills
1022	Scottie	A	,, ..	T. Fullam, junior	Torrumbarry P.O.
953	Scottish Laird ..	4	,, ..	T. Edson ..	Glenorchy
1178	Scottish Prince ..	A	,, ..	R. D. Buckley ..	Lawloit
1132	Scotty Chief ..	A	,, ..	W. W. Merrett ..	Custon, South Australia
674	Selkirk	A	Light ..	A. Scott ..	Elmore
906	Selsiam	3	,, ..	T. Edson ..	Glenorchy
822	Seymour	A	Draught ..	J. Cleeland ..	Newhaven
829	Shepherd	A	,, ..	J. R. May ..	Beulah
680	Shepherd	3	,, ..	W. H. Holmes ..	Rainbow
1123	Shepherd's Pride ..	4	,, ..	E. J. Black ..	Casterton
1183	Shirley Bantam ..	A	Light ..	B. Gannan ..	Penshurst
821	Silver Bells ..	A	,, ..	T. Coonertz ..	Yarragon
656	Silver Claim ..	A	Thoroughbred	M. Hutcheson ..	Pine Grove P.O.
990	Simon Again ..	4	Draught ..	C. T. Wallis ..	Lockwood
638	Sir Angle	A	Light ..	L. S. Cadman ..	Corryong
690	Sir Dale	5	Draught ..	A. Sands ..	Sea Lake
733	Sir Richard 2nd ..	A	Pony ..	W. Henderson ..	Grasmere
1143	Sir Rupert ..	4	Draught ..	G. Kelly ..	Diggora
712	Sir Walter Burnside ..	3	,, ..	F. Schroeder ..	Murrayville
998	Sir William ..	5	,, ..	McQueen Bros. ..	Waubra
732	Smart Style ..	A	Light ..	R. Davis ..	Kunat
1047	Southern Star ..	A	Draught ..	L. Curran ..	Cannie
945	Southerton ..	A	Light ..	F. Mason ..	Stawell
1111	Speculation ..	5	,, ..	D. F. Bourke ..	Rochester, P.O.
810	Sportsman ..	3	Thoroughbred	R. Davison ..	Donald
754	Sportsman's Hero ..	A	Draught ..	A. Kennedy ..	Arcadia
1082	Squire Belmont ..	4	,, ..	H. Trimble ..	Pine Lodge R.S.
897	Stamperland Star ..	3	,, ..	A. Gillies ..	Racecourse-road, Newmarket
883	Starlight	A	Pony ..	J. Giles ..	Bairnsdale
703	Stivious	4	Light ..	A. W. Lackman	Murrayville
890	Stockart	3	Draught ..	O. Olson ..	Jeparit
771	Stockman's Lad ..	5	,, ..	J. F. A. Schulz ..	Lake Hindmarsh, Jeparit
1180	Sudbourne's Chief ..	3	,, ..	A. J. Porter ..	Seymour
720	Suggestion ..	A	Thoroughbred	A. T. Heath ..	Warracknabeal
1080	Sultan	4	Light ..	M. Swan ..	Avenel
693	Sum Time	3	Draught ..	J. H. Thomas ..	Yatpool P.O.
1125	Taffy	A	Pony ..	H. Jarvis ..	Omeo
715	Taffy	A	,, ..	A. W. McIntyre ..	Dunkeld
672	Taffy	A	,, ..	J. Sargeant ..	Yanac
1039	Tenor Voyage ..	4	Light ..	F. Siebel ..	Thomastown
602	Territorial	A	Draught ..	R. M. Thomas ..	Devon North
1128	The Banker ..	4	,, ..	A. Templeton ..	Coleraine
601	The Butler ..	A	Light ..	H. Carter ..	Natimuk
1198	The Colonel ..	4	Draught ..	McDonald Bros. ..	Mortlake

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
982	The General ..	A	Light ..	D. Shelley ..	Bungaree
942	The Macdonald ..	A	Draught ..	A. Wohlers ..	Mt. Wallace, *viâ* Ballan
731	The Masher ..	A	Light ..	Wm. Williams ..	Strathmerton
603	The Nipper ..	A	Pony ..	T. H. Bush ..	Pennyroyal
1108	The Retainer ..	A	Light ..	W. McGowan ..	Sea Lake
1140	The Roster ..	4	,, ..	A. Rogers ..	Horsham
845	The Trick ..	A	,, ..	W. Mellington, jnr.	Rainbow
1024	The Verger ..	A	,, ..	E. Bowman ..	Ebden
1062	The Voyager ..	5	,, ..	H. H. Nairne ..	Tongala
1037	Thornstone ..	4	Thoroughbred	C. Hoysted ..	Glenrowan
895	Timely Direct ..	4	Light ..	J. M. Cromie ..	Swan Hill
1162	Tinytown	A	Pony ..	J. Deane ..	North Essendon
927	Titiroa Baron ..	A	Draught ..	A. Courboules ..	Cape Clear
1124	Tom Thumb ..	A	Pony ..	W. F. Eichler ..	Chillingollah
1101	Tom Walton ..	A	Draught ..	Cameron and McKenzie	Warracknabeal
604	Tommy	A	Pony ..	Boyd Bros. ..	Tarrone, Koroit
1185	Tommy Dodd ..	4	,, ..	Boyd Bros. ..	Minhamite
816	Tommy Huon ..	A	Light ..	J. Watkins ..	Euroa
1179	Tony Bells ..	A	,, ..	R. Hannah ..	Lilydale
640	Torfrid	A	Thoroughbred	D. Rogers ..	Boolara P.O.
605	Tracey Boy ..	A	Light ..	Smith and Sons ..	Mernda
1044	Tracey Voyage ..	5	,, ..	Mackin Bros. ..	Korong Vale
742	Tresco	A	,, ..	A. E. Bowman ..	Ebden
779	True Blue ..	4	Draught ..	C. S. Maddern ..	Kaniva
1097	Typical Voyage ..	3	Light ..	W. B. Harris ..	Cobram
1195	Udale Jack ..	4	Draught ..	Manifold and Co.	Weerite
926	Union	A	Pony ..	W. A. Anderson ..	Allansford
1189	Unit	5	,, ..	B. Rogers ..	Mepunga East
676	Valmour	3	Draught ..	R. Hetherington ..	Mt. Gambier
1152	Vanguard ..	A	,, ..	G. and W. Lord ..	Rosedale
843	Vanquisher ..	A	,, ..	J. Meagher ..	Murrayville
960	Vice Regal ..	3	,, ..	A. E. Petering ..	Minyip
962	Vice Regal ..	4	,, ..	Mrs. I. B. Walker	Swan Hill
763	Viceroy Yet ..	2	,, ..	J. Bunge and Sons	Sheep Hills
778	Viceroy's Wonder ..	3	,, ..	W. Schultz ..	Warracknabeal
943	Vocal King ..	A	Thoroughbred	A. W. Giddings	Sea Lake
956	Waituna	3	Draught ..	S. A. Greaves ..	Narre Warren
948	Wakapero ..	4	,, ..	G. E. Jenner ..	Kerang East
860	Waverley Glen ..	4	Pony ..	A. R. Dalton ..	Hotham-street, East St. Kilda
944	Wee Jim	A	,, ..	E. R. Pickering	Portarlington
1138	Wee Key	4	,, ..	R. Kirkwood ..	Byaduk North
619	Welcome Abbey ..	A	Light ..	Jas. Button ..	Ballarat North
833	Welsh Flyer IV. ..	A	Pony ..	J. Williams ..	Nalinga
743	Weralte	A	,, ..	A. E. Bowman ..	Ebden
844	Western Lad ..	A	Draught ..	J. and C. Ross ..	Lake Bolac
606	Westmont	A	Light ..	Wm. Hay ..	Bullock Swamp
1194	Whip Voyage ..	4	,, ..	J. Peters ..	Cobden
1011	White Star ..	6	,, ..	G. Kelly ..	Powlett Plains
750	Who's Who ..	5	Pony ..	F. Fairbairn ..	Dalgety's buildings, Bourke-street, Melbourne
739	White Stockings ..	A	Light ..	Munro Bros. ..	Walpeup

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
791	Widgiewa Belmont	3	Draught	C. H. Perkins	Rainbow
1079	Widgiewa Edward	4	,,	W. G. Down	Koonda P.O.
710	Widgiewa Fashion	4	,,	W. and L. Oliver	Diggora West
1029	Widgiewa Ivo	5	,,	W. G. Wilkinson	Tungamah
1087	Widgiewa Marshall	4	,,	J. Christie	Katunga
722	Wiewood	A	Light	W. Raftery	Shepparton
607	Wigtonshire	A	Draught	J. Cobain	Sale
803	William Sportsman	3	,,	W. A. Dehnert	Ballan
689	Willie Craig	5	,,	G. Oxley junior	Gre Gre North
608	Winsome Chief	A	,,	Peterson and Bourchier	Kellalac
610	Winter Wild	A	Light	F. A. Mitchell	49 McGregor-street, East Malvern
812	Wizard Junior	A	Pony	J. A. Goodwin	Wunghnu
898	Worthy Mac	4	Draught	J. Elliott	Kyabram
611	Wotan	6	Thoroughbred	Dickinson Bros.	Sebastopol
881	Yet Again	A	Pony	J. Beard	Terang
1061	Young Buchlyvie	3	Draught	J. K. Hamilton	Stanhope P.O.
1164	Young Clyde	A	,,	J. Ludeman	Brucknell
612	Young Clydeside	6	,,	W. Fozard	Bendigo
868	Young Cymra Bach	A	Pony	C. H. Holmes	Jil Jil
809	Young Dan	5	Draught	J. R. Tonkin	Mt. Jeffcott
614	Young Dandy's Pride	A	Pony	J. W. Powell	Becac
1002	Young Ki Ki	A	,,	T. Robertson	Macarthur
892	Young Lad	4	,,	W. H. Gillett	Lara
639	Young Major	A	Draught	C. Gould	Tatyoon P.O.
730	Young Patrician	A	,,	F. E. Southwell	Linga
986	Young Repeater	A	,,	A. W. Lackmann	Murrayville
1131	Young Rysharold	A	Pony	W. Brown	43 Princes-street Fitzroy
901	Young Several	3	Thoroughbred	L. Tognoline	Tandon
615	Young Shifter	A	Light	A. Linke	Jeparit
685	Young Simon	3	Draught	G. J. Butler	Carisbrook
616	Young United Prince	A	,,	W. G. Young	Neerim

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

SPRAYING.

The spray pump should now be in thorough working order, so that the various spring sprayings may be carried out with as little interruption as possible. It is always wise to clean out the pump after each spraying, so that it will be ready for the next mixture. Putting a different spray in a pump barrel that has not been washed out, very often causes the formation of a sediment, which blocks the nozzle and interrupts the work.

During November it will be necessary to spray for codlin moth, peach aphis, pear slug, and various leaf-eating insects. In addition, black spot of the apple and pear, shot hole, and other fungus diseases must be kept in check. As various sprays are required for all of these troubles, the necessity of always having a clean pump is evident.

At the present time the best spray for peach aphis is strong tobacco solution, and the same spray may also be used for the pear slug. Arsenate of lead is the better spray for this latter insect, but it should not be used when the fruit is approaching the ripening stage; hellebore may also be used for the slug with good effect.

As a preventive against codlin moth, the trees should be kept well sprayed with arsenate of lead. The first spraying should have been given at the time of the falling of the petals; the second spraying, owing to the rapid expansion of the fruit, should be given a fortnight later. After that the grower must use his own judgment as to the necessity for subsequent sprayings. If the moths be at all prevalent, other sprayings will be quickly necessary.

As the woolly aphis is increasing at this time of the year, it will mean a saving of a large number of buds if this insect be sprayed. Nicotine solution, pine spray, or lime sulphur may be used with good effect.

Cultivation.

The work of ploughing and harrowing should be completed immediately. All crops for green manure should be now under cover, and if the orchard soil is at all heavy or stiff, the grower should make up his mind to grow a crop next season, in order that this condition may be reduced.

The orchard should be kept free from weeds, not only for the conservation of moisture, but in order to do away with all hiding places of the Rutherglen fly, cutworm moths, &c.

General Work.

Grafted and newly-planted trees should be frequently examined, and given an occasional watering and overhead spraying, in order to encourage their growth, and to prevent loss of moisture from the foliage. It is also advisable to mulch young trees with light grass, or straw mulching not too rich in animal manure.

The disbudding of unnecessary shoots and the pinching back or stopping of growths, to prevent their becoming unduly long, may now be carried out. This work is particularly important on young trees.

Graft ties should be examined, and the ties cut wherever any growth is being made. Where the grafts are likely to make any long growth, they should be well staked and tied.

Citrus trees may be planted out, and, after planting, they should be watered and mulched.

The Vegetable Garden.

Tomato plants should now receive attention every day; laterals will require pinching back; crowded bunches and shoots should be thinned; the plants should be well tied to the stakes, and liberal supplies of water and manure should be given. One or two more plantings of tomato plants may still be made, so that there may be strong, sturdy plants

for the production of late fruits. By planting three or four successions of plants, it is possible to have a good supply of fruits from December to June. Pull up and burn all plants showing any signs of disease.

Any potash manure may be used to assist in combating the spotted wilt.

Celery may now be sown for winter crops. French beans should be largely sown. Cucumber, melon, pumpkin, and all seeds of this family may now be sown in the open.

Where these plants are already growing, the longest and strongest runners may be pinched back, to throw the strength into flowering and lateral growths. Watch the plants for mildew, and use sulphur freely wherever present, especially on the young plants.

Peas, lettuce, radish, turnip, cabbage, and sweet corn seeds may be sown this month. Seedlings from former sowings may be planted out, and it would be well to dip the whole plant in water before planting. This greatly assists the young plants while taking hold of the soil in their new location.

Frequent waterings and frequent cultivation will now be necessary; and all weeds must be hoed or hand-weeded out; mulching with stable manure will greatly assist the plants.

A few beds should now be deeply worked, adding a liberal dressing of stable manure. These plots will then be ready for the celery, cabbage, and other seeds planted during this month.

The Flower Garden.

Continue to plant out the various bedding and foliage plants, corms of gladioli, and seed of such tender annuals as Phlox Drummondi, balsam, zinnia, nasturtium, celosia, aster, cosmos and portulaca.

While seeds planted out in the open germinate and grow fairly well, it is advisable during the summer months to plant these in sheltered seed beds, or in a canvas or calico frame. The protection need be on the one side only, preferably the west or north-west; the seedlings are then protected during the hottest part of the day. At the same time the shading should not be sufficient to unduly "draw" them.

The seeds should not be deeply sown, and all waterings should be light. A little water, often, should be the rule for seedlings. Annuals require plenty of room when planted out in the garden. Being quick growers, they are generally gross feeders, and they must have space to develop a good root system. Feeding, too, with liquid manure is helpful when they are reaching the flowering stage.

Dahlias may now be planted out, either from tubers or from young rooted cuttings. These will give good early summer blooms. For autumn and show blooms, the planting should be deferred until the middle of December.

Herbaceous and succulent plants should be staked for protection; included in this section are delphinium, gladiolus, perennial phlox, rudbeckia, &c. These plants will all benefit from liberal mulchings and watering with liquid manure when approaching the blooming period. Spring flowering bulbs, corms, and tubers should now be lifted and stored.

The soil surfaces will now benefit from frequent hoeings and stirrings. Constant waterings will be required if the weather be hot or windy.

the cultivation should quickly follow the waterings in order that the moisture may be thoroughly conserved. Mulching with stable manure is also beneficial at this season.

REMINDERS FOR DECEMBER.

SHEEP.—Dispose of all faulty-mouthed ewes, inferior-fleeced coarse-flock sorts in best condition at any time possible. Those in favoured areas should replace with younger, finer-grade sorts. Where ewe lambs are intended to be held for future breeding, see that the cross results in shafty, fine to medium grade fleeces, as well as a shapely frame. Allow rams to remain with the ewes at least seven weeks, this period admitting of any ewes coming in season the second time. It is rarely necessary to join more than 3 per cent. of 2 tooths, 3 per cent. of 5 and 6 year olds, or 2 per cent. of 2, 3 and 4 year old rams, unless with young ewes. Where conditions justify it, 4 per cent. of vigorous matured rams with aged coarse crossbred ewes will bring a greatly increased number of twin lambs. Clear wool from eyes, and burrs from about the pizzles of rams, and cut hoofs into shape before mating. Ewes should be of one breed, or as near one cross as possible, to insure an even and rapid dropping. Merino and fine cross ewes are in season earliest, first cross or half-breds later, and all ewes with a preponderance of British blood later still. It is useless to join rams with ewes until their proper time of coming in season. Ewes carry their lambs four months, four weeks, four days, or roughly, five months.

BEE-KEEPING.

December is the month for the main honey flow from yellow box and red gum. Swarming is practically over for the season except, perhaps, in late districts. Where there has been more swarming than the owner of the bees desired, and the total yield of honey is the object aimed at rather than increase in the number of colonies, the weaker stocks may be united at the commencement of the honey flow, as the highest return is secured by having a given number of bees in the fewest possible number of hives; that is to say, 50,000 worker bees in one hive will store a far greater amount of honey than the same number in two hives with 25,000 bees in each. Such a large worker-force requires three bodies of full-depth frames, otherwise the best results cannot be obtained, because nectar being as thin as water when brought in by the bees, only a little is put into each cell to hasten evaporation. When, therefore, sufficient empty combs are not available to the bees, part of the worker-force will be idle.

Each colony should have at least three sets of Langstroth size combs, and when these are not available the time of the red gum honey flow is suitable for getting new combs drawn out from full sheets of foundation. Comb foundation is expensive, but in the end combs built from starters are more expensive still, because so much drone comb is built when starters only are given, that one of the principal advantages of the frame-hive system is lost.

All frames should be wired, four horizontal wires being most in favour with beekeepers; the wires should be well embedded into the foundation so that it may not come away from them. Between the bottom edge of the sheet of foundation and the bottom bar of the frame there should be a space of at least ⅜-inch, to allow for the expansion of the sheet by the heat of the hive.

The best combs are obtained when the foundation is drawn out by the bees in the super immediately over the brood nest without an intervening excluder.

Combs should be capped at least two-thirds before being extracted, so that the honey will be of good density. When hives are run three stories high, as indicated above, there is no necessity to extract all the honey at one time; one set of combs can be extracted, and the empty combs returned to the hive, and when they are partly filled again the others can be taken. In this way the bees are not upset so much as when all the combs are wet and sticky after extracting, and the risk of leaving the hive destitute of stores is avoided should the honey flow suddenly cease.

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SOY or SOJA BEANS

Splendid Fodder for Stock. Excellent for Hay.
Of great value for its Fertilizing Properties.

The Soy Bean plant is as high in feeding value as Lucerne, and may be used in the form of hay, pasture, silage, or soilage, or as a protein concentrate.

In the warmer districts, with irrigation, gives wonderful results.

It is not only a soil improver, gathering most of its nitrogen requirements from the air, but it furnishes a protein rich forage for hay or silage, or a concentrated feed in the form of the threshed beans.

If grown with maize, and made into ensilage, it gives practically a balanced ration for dairy cows. Sow them in between the rows of maize, and harvest them in the one operation for chaffing for the silo. Being of more rapid growth than maize, it is best to cultivate the maize thoroughly a time or two, and then sow the beans between the rows and harvest when ready.

Soy Beans grown alone for Seed or Hay solve the problem of preparation of Winter wheat ground, since they leave the soil in excellent condition for wheat with no preparation whatever

For Hay or Fertilizer, sow 60 to 90 lbs. per acre. If sown between rows of maize, sow 60 lbs. per acre.
PRICE—1/- lb.; 50/- bushel (60 lbs.).

TESTIMONIAL *re* SOY BEANS

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Dear Sirs,—Was pleased to hear you had again got a supply of Soy Beans. Through inability to procure seed last season, my stock did not do so well last autumn without them. I find them a splendid rich food for cows, and, when fed to them at the end of the milking season, every cow responds wonderfully by increasing in yield both of milk and of butter fat.

We sow them during November in drills 3 ft. apart, and horse-hoe them two or three times. If kept well cultivated and free from weeds, they make a wonderful growth of succulent foliage during summer. We feed them to the stock just as the pods are forming. Cattle and horses are both particularly fond of them, the latter will break down fences to get them when once they get a taste thereof.—Yours faithfully,

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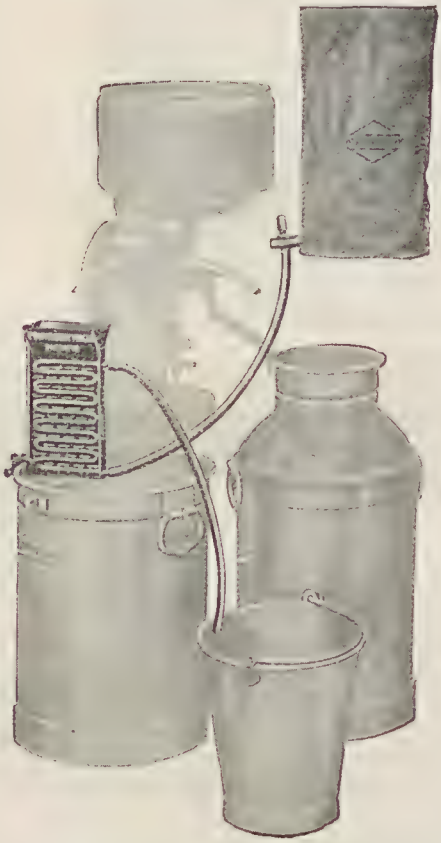

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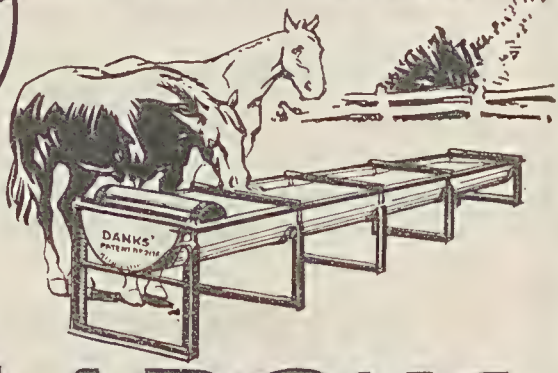

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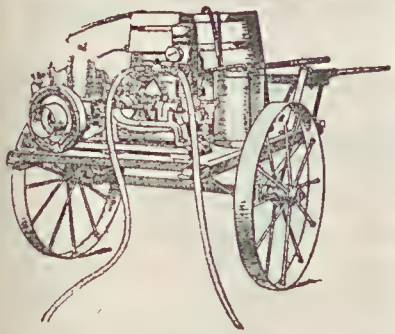

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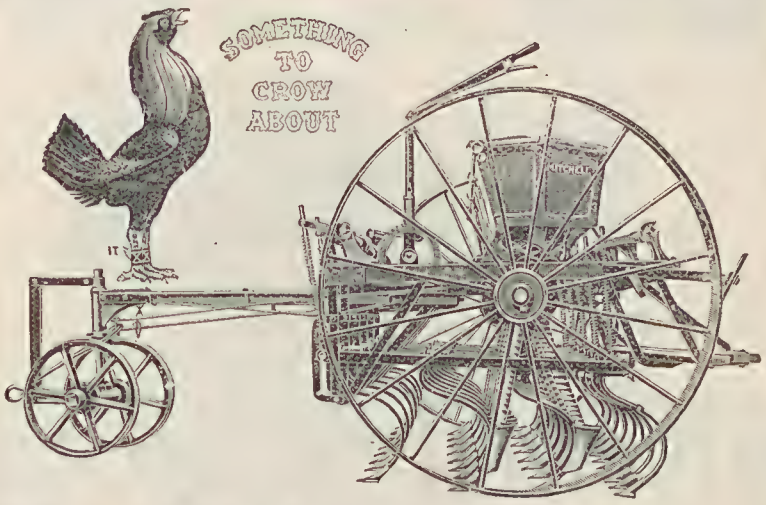

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One of the advantages of the MITCHELL is that ONE LEVER OPERATES ALL THE FLOATS TOGETHER, and keeps all the points of the four rows level. All other machines have two levers, which take longer to operate, and it is difficult to get the points level with two levers, or to know when they are level (18 and 21 sizes have 2 levers, lifting left and right halves of floats).

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Some machines sow and cultivate at different depths, and thus only cultivate half the soil. The sowing tynes sow 7 inches apart at, say, 2 inches deep; while the cultivating tynes cultivate 7 inches apart at, say, 4 inches deep. By this the ground would only be cultivated in 7 inch rows, instead of every bit of it as does the MITCHELL. Such machines defeat the special purpose of the combine, which is to cultivate all the ground while sowing. Don't be misled. Get a MITCHELL.

The MITCHELL does perfect work as a Cultivator. There is no wear on the drilling parts when so used. Note the extra high wheels giving light draft and plenty clearance.

Everything for Farm, Orchard, Dairy, Road. Write. Please say you saw this.

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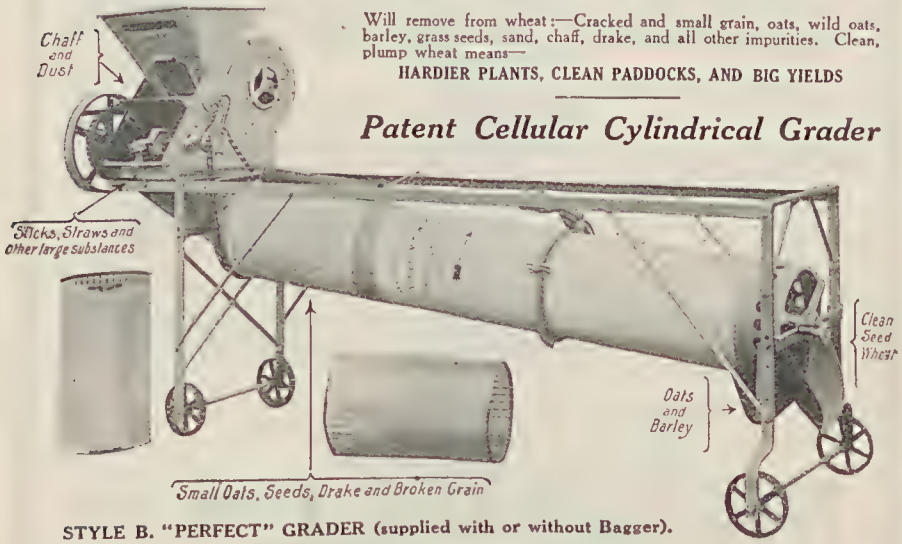
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Will remove from wheat:—Cracked and small grain, oats, wild oats, barley, grass seeds, sand, chaff, drake, and all other impurities. Clean, plump wheat means—

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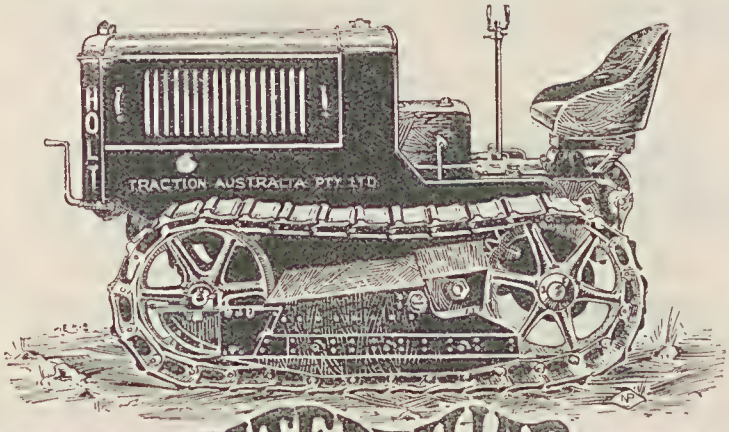

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A Tractor that weighs approximately 4,000 Pounds, that has 15 Horse Power at the drawbar, that is only 4 feet wide.—These, in brief, are the specifications of the T 35 "Caterpillar" Tractor. Big capacity for work, exceptionally low fuel and oil cost, minimum upkeep expense. That sums up its performance. Add to these the features of adaptability to an extremely wide range of work and to ALL kinds and conditions of ground and weather, ease of operation, simplicity of construction, perfect accessibility, and you have the IDEAL Tractor.

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Facilities are provided for producers and smaller exporters of the various kinds of produce, so that direct shipments on their own account may be undertaken. The Government ownership and conduct of Cool Stores places producers in an independent position, and, in addition, preserves an open channel for the carrying on of the export trade in perishable products.

The Department of Agriculture will receive, handle, freeze, store, and ship **Butter, Cheese, Eggs, Fruit, Meat, Poultry, Rabbits and Hares, &c.,** for producers and exporters.

Produce to the value of over **£30,000,000** has been treated at the **Government Cool Stores.**

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DEPARTMENT OF AGRICULTURE

GOVERNMENT COOL STORES

VICTORIA DOCK

The Stores have a capacity of **743,980 cubic feet insulated,** and are capable of holding **372,000 boxes of butter,** or **248,000 cases of fruit,** or **335,000 carcasses of lamb and mutton.**

Electric motor power totals 900 H.P.

Produce can be placed on conveyors at any point and mechanically carried to any chamber in the building, or conveyed from the chambers direct into the ship's hold.

The Railway Department Goods Sheds are adjacent to and connected with the Cool Stores by direct lines; delay and exposure of produce through shunting in the Spencer-street yards, or cartage, are thus avoided. The Stores are situated in close proximity to the Victoria Dock, where vessels drawing up to 30 feet of water can be berthed; excellent facilities for the efficient and economical treatment and shipment of frozen and perishable products are provided.

Expert Officers are connected with every Branch, so that any one requiring information regarding the production, preparation, and shipment of produce can rely upon being promptly supplied with up-to-date information upon all matters.

Department of Agriculture, Victoria.

PURE FRIESIAN HERD

Bull Calves for Sale

(1) Bull Calf *ex* Dominion Belle Corona

Dropped 24th January, 1923

(Registered No. of Dam 369 Friesian Herd Book of Australia, Vol. 2).

Sire: **Victoria Songboy (359)** by Dominion Domino Dutch Boy (1206 N.Z F.H.B.) (73 F.H.B.A.).

Sire of Dam: **Oak de Kol 2nd Homestead Fobes** (imp. to N.Z. from America) (341 N.Z.F.H.B.).

Dam's Record for 273 days under Government Herd Test—
11,646 lbs. Milk, 3·61 Test, 420 lbs. Butter Fat.

For Full Lactation Period—
11,715 lbs. Milk, 3·61 Test, 424 lbs. Butter Fat.

(2) Bull Calf *ex* Dominion Proud Lassie

Dropped 26th February, 1923

(Registered No. of Dam 368 Friesian Herd Book of Australia, Vol. 2).

Sire: **Victoria Songboy (359)** by Dominion Domino Dutch Boy (as above).

Sire of Dam: **Woodcrest Jo** (imp. to N.Z. from America) (334 N.Z.F.H.B.).

Dam's Record for 273 days under Government Herd Test—
11,336 lbs. Milk, 3·42 Test, 387 lbs. Butter Fat.

For Full Lactation Period—
12,216 lbs. Milk, 3·51 Test, 428 lbs. Butter Fat.

(3) Bull Calf *ex* Dominion Hyacinth

Dropped 29th August, 1923

(Registered No. of Dam 374 Friesian Herd Book of Australia, Vol. 2).

Sire: **Victoria Songboy (359)** by Dominion Domino Dutch Boy (as above).

Sire of Dam: **Oak de Kol 2nd Homestead Fobes** (imp. to N.Z. from America) (341 N.Z.F.H.B.).

Dam's Record for 273 days under Government Herd Test—
11,512 lbs. Milk, 4·08 Test, 479 lbs. Butter Fat.

For Full Lactation Period—
13,898 lbs. Milk, 4·24 Test, 589 lbs. Butter Fat.

The record of Victoria Songboy's dam DOMINION MADRIGAL for 273 days under Government Herd Test is 11,373 lbs. Milk, 3·93 Test, 448 lbs. Butter Fat; and for Full Lactation Period 13,485 lbs. Milk, 4·17 Test, and 563 lbs. Butter Fat. "Dominion Madrigal" is a full sister to "DOMINION QUEEN MERCEDES," third cow of all breeds under Government Herd Test 1923, and Winner "Weekly Times" Butter Competition, Melbourne Royal Show 1923, and Champion Melbourne Royal Show 1923.

INSPECTION of these Bull Calves at the Horticultural Gardens, Burnley, is invited.

APPLICATION FOR PURCHASE to Dr. S. S. Cameron, Director of Agriculture, Melbourne.

DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department will shortly have completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter ***fat*** yielded.

(For Record of Yields of dams see Red Poll Herd Book.)

The Bulls in Use include—

LONGFORD MAJOR (Imported)

Dam's Record 14713 lbs. milk ... 6 years average 11338 lbs. milk
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BELLIGERENT (Imported)

Dam's Record (1st milking) 7144 lbs. milk.

Dam's Dam's	,,	14533 lbs. milk	...	4 years	average	12871 lbs. milk
Sire's Dam's	,,	10370 ,,	...	7 ,,	,,	9354 ,,
Sire's D. Dam's	,,	9510 ,,	...	12 ,,	,,	8033 ,,
G. Sire's D. Dam's	,,	10215 ,,	...	7 ,,	,,	9386 ,,
G.G. Sire's D. Dam's	,,	12565 ,,	...	10 ,,	,,	8853 ,,
G.G.G. Sire's D. Dam's	,,	10088 ,,	...	2 ,,	,,	9754 ,,

Inspection of the Herd is Invited.

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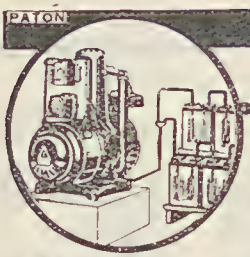

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Circulates throughout the **Country Districts** of **Victoria** and amongst **Farmers** of the **Commonwealth**, reaching also country professional men, tradesmen, schoolmasters, teachers, and the like.

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Rates on application to the Official Canvasser—

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THE KING OF
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"The crop that gives a continual harvest without an annual ploughing or seeding."

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Write for YATES' BOOKLET ON LUCERNE GROWING, Post Free.
It will give you much information.

We are Head-quarters for
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We are convinced that for Australian conditions no strain of imported seed can compare with the best of our own local saved Lucerne. This has been proved in our own Trial Grounds, in Government Tests, and by the experience of all large users, and is even confirmed in other countries in which climatic conditions are similar, where our Lucerne seed has proved to come quicker in the Spring and give a later cut in the Autumn than any other strain. We cannot recommend and therefore do not stock imported Lucerne seed of any description, nor do we stock local seed which has been grown on irrigation areas.

YATES' BROADLEAF A.Y. GIANT-UPRIGHT LUCERNE

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NOTE SPECIALLY—We deliver Seed at the following Sydney quotations **FREE ON RAILS MELBOURNE** in any quantity

Per lb. (in small quantities)	- -	2/4
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